

**SONY®**

FLAT PANEL DISPLAY

**PFM-42X1**  
**PFM-42X1N**

COMPONENT/RGB ACTIVE THROUGH ADAPTOR  
**BKM-V12**

SPEAKER SYSTEM  
**SS-SP20B**  
**SS-SP20S**

REMOTE COMMANDER  
**RM-971**

SERVICE MANUAL  
1st Edition

## 警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

## **WARNING**

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

## **WARNUNG**

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## **AVERTISSEMENT**

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

### **CAUTION**

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

### **ADVARSEL**

Lithiumbatteri - Eksplosjonsfare.  
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.  
Brukt batteri returneres apparatleverandøren.

### **Vorsicht!**

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

### **VARNING**

Explosionsfara vid felaktigt batteribyte.  
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparatillverkaren.  
Kassera använt batteri enligt gällande föreskrifter.

### **ATTENTION**

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

### **VAROITUS**

Paristo voi räjähtää jos se on virheellisesti asennettu.  
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.  
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

### **ADVARSEL!**

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.

Udskiftning må kun ske med batteri af samme fabrikat og type.

Levér det brugte batteri tilbage til leverandøren.

**For the customers in the Netherlands**  
**Voor de klanten in Nederland**

Hoe u de batterijen moet verwijderen, leest u in de tekst van deze handleiding.

Gooi de batterij niet weg maar lever deze in als klein chemisch afval (KCA).



**Für Kunden in Deutschland**

Entsorgungshinweis: Bitte werfen Sie nur entladene Batterien in die Sammelboxen beim Handel oder den Kommunen. Entladen sind Batterien in der Regel dann, wenn das Gerät abschaltet und signalisiert "Batterie leer" oder nach längerer Gebrauchsdauer der Batterien "nicht mehr einwandfrei funktioniert". Um sicherzugehen, kleben Sie die Batteriepole z.B. mit einem Klebestreifen ab oder geben Sie die Batterien einzeln in einen Plastikbeutel.

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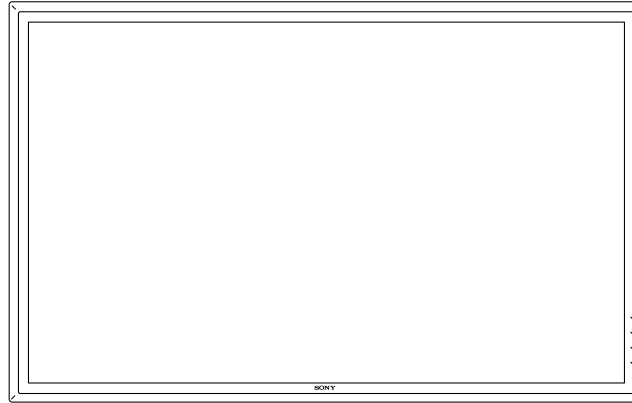
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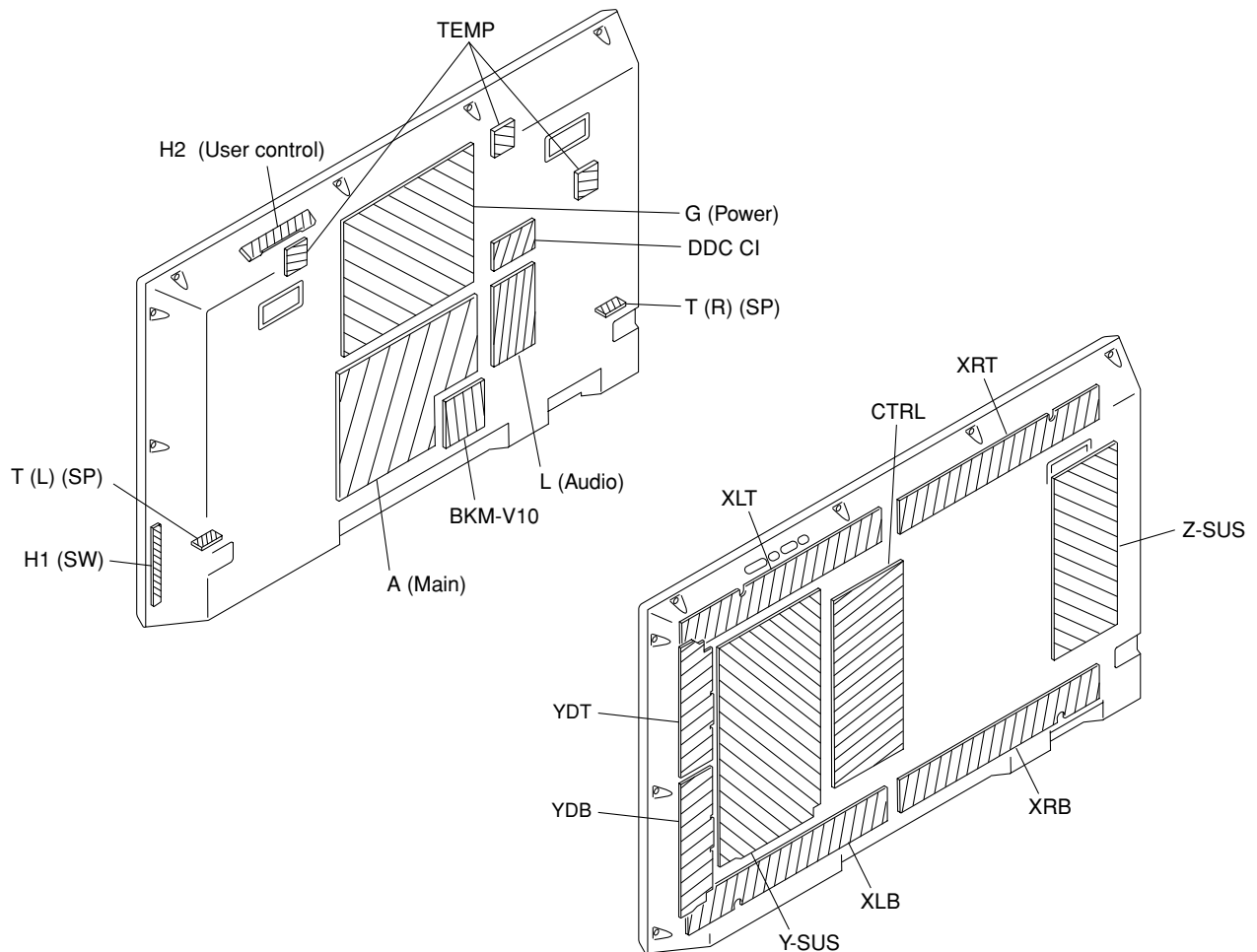
# Section 1

## Service Overview

### 1-1. Appearance Figure

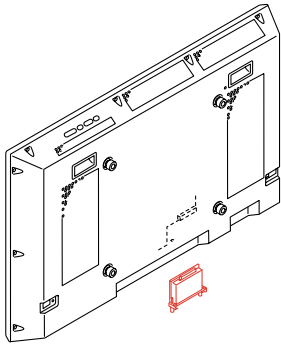


### 1-2. Board Locations

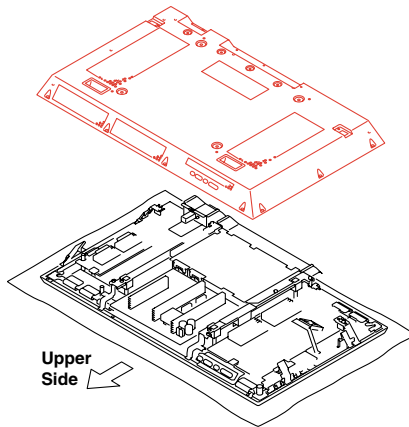


## 1-3. Disassembly

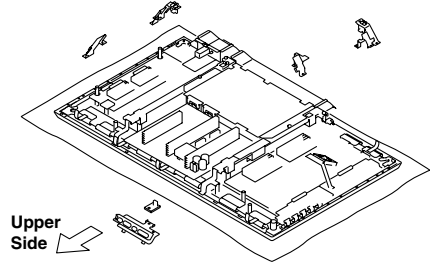
### 1-3-1. BKM-V10



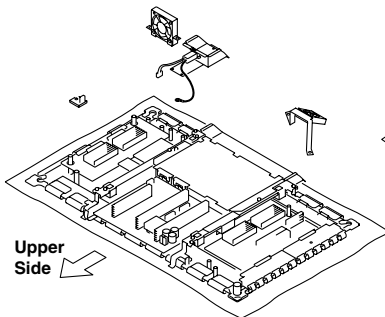
### 1-3-2. Rear Cover Assembly



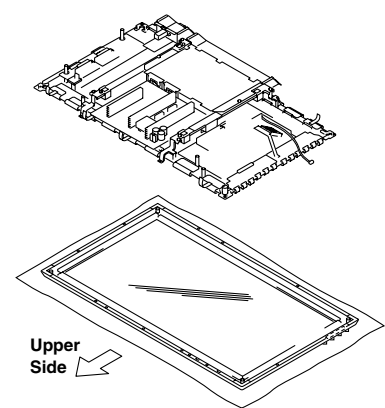
### 1-3-3. Bezel Assembly 1



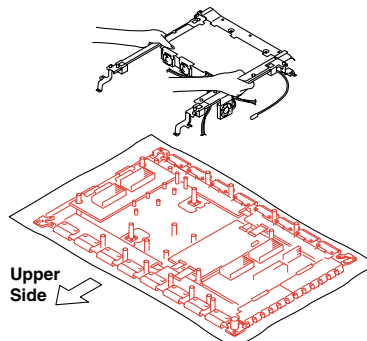
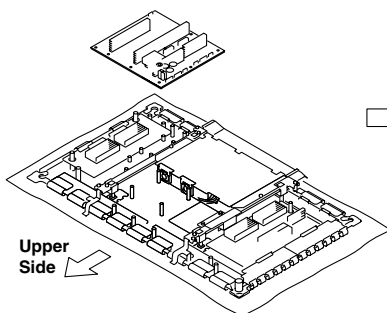
### 1-3-5. Plasma Display Panel 1



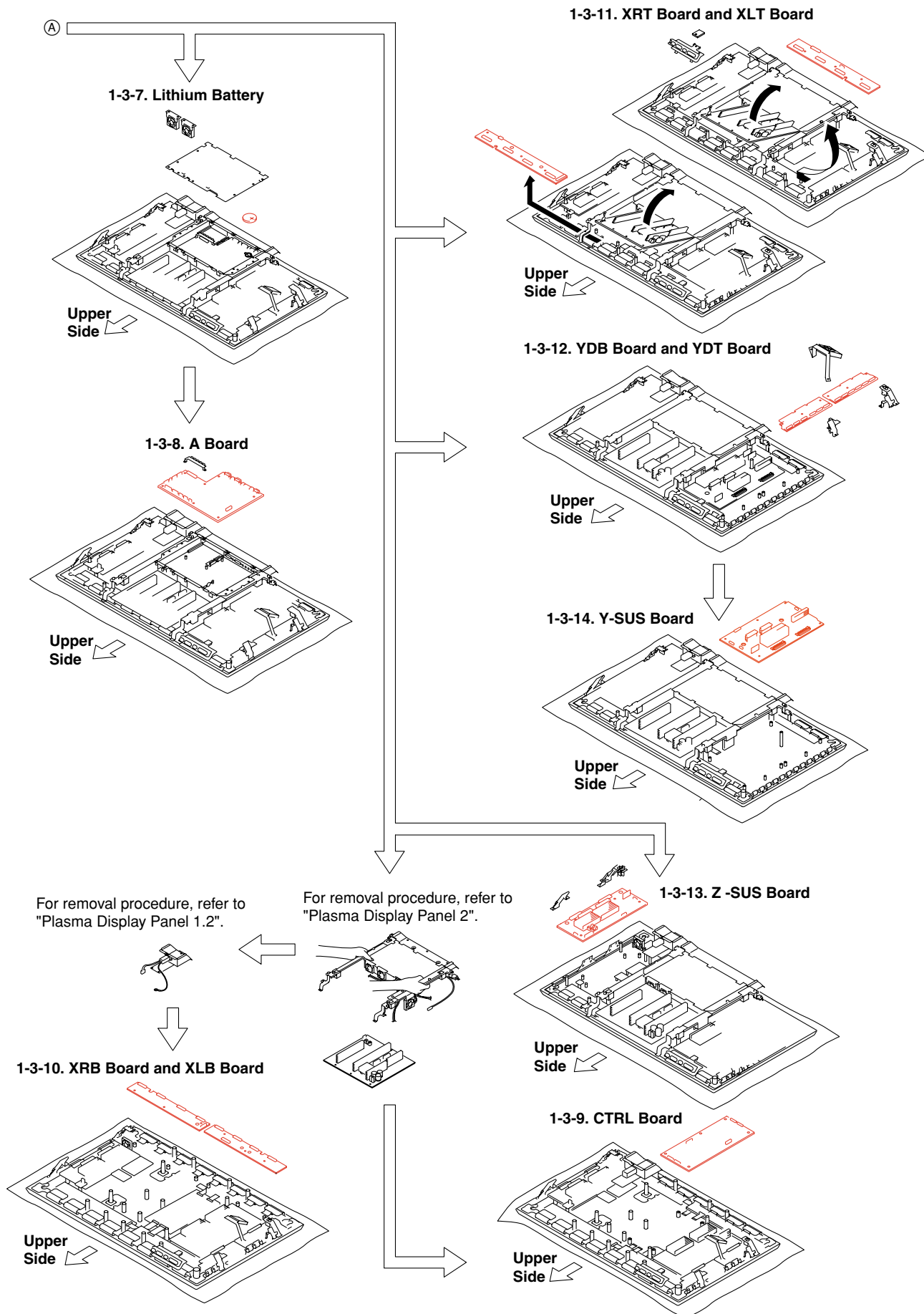
### 1-3-4. Bezel Assembly 2



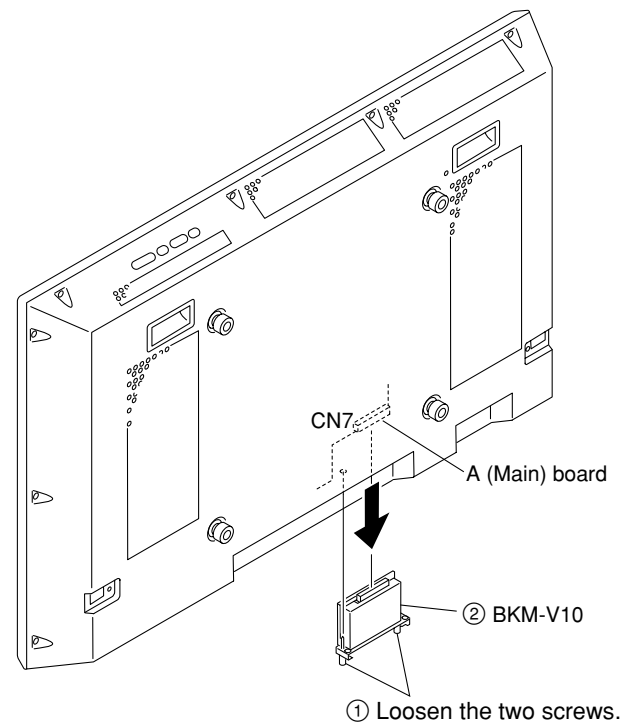
### 1-3-6. Plasma Display Panel 2



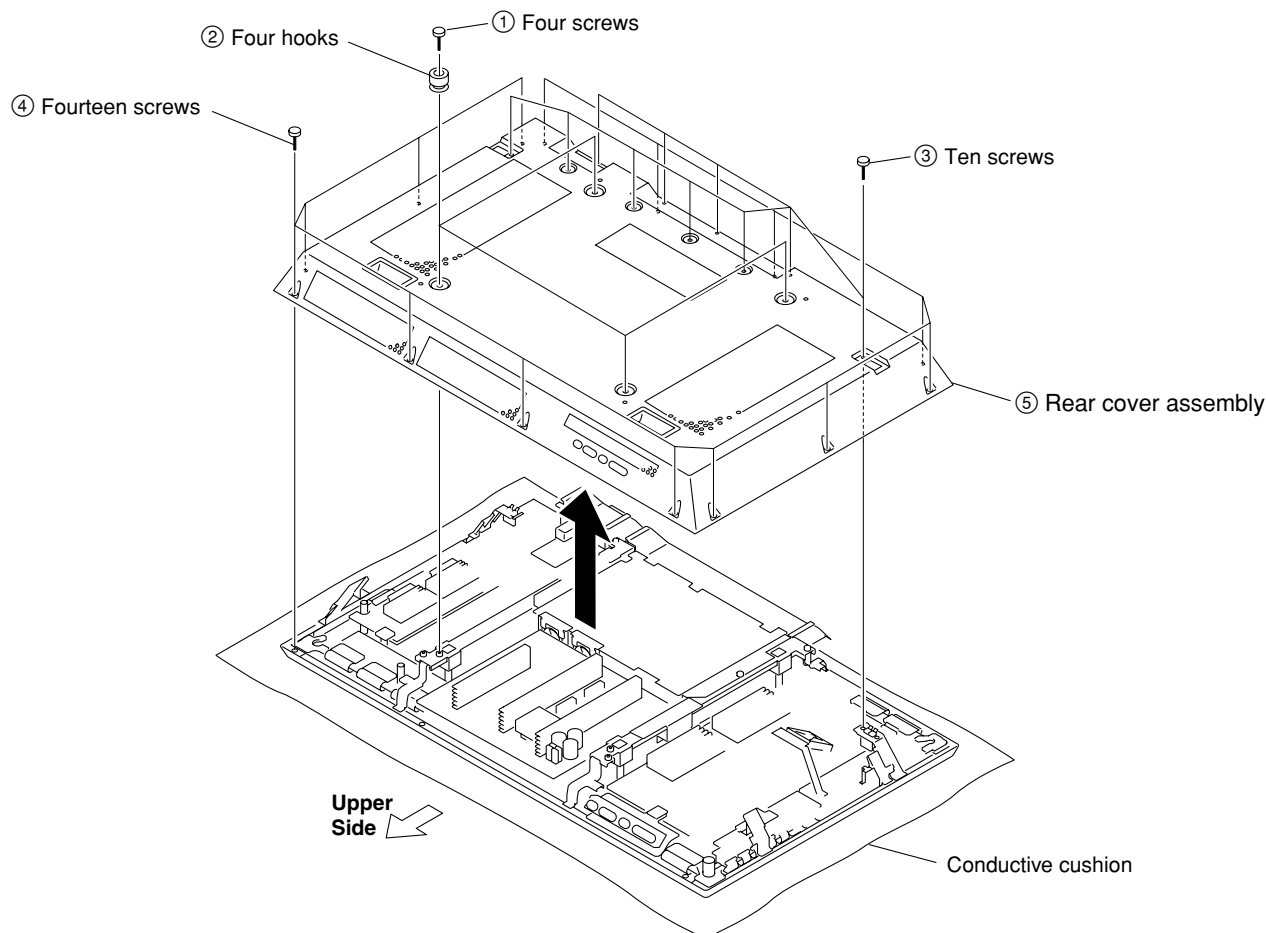




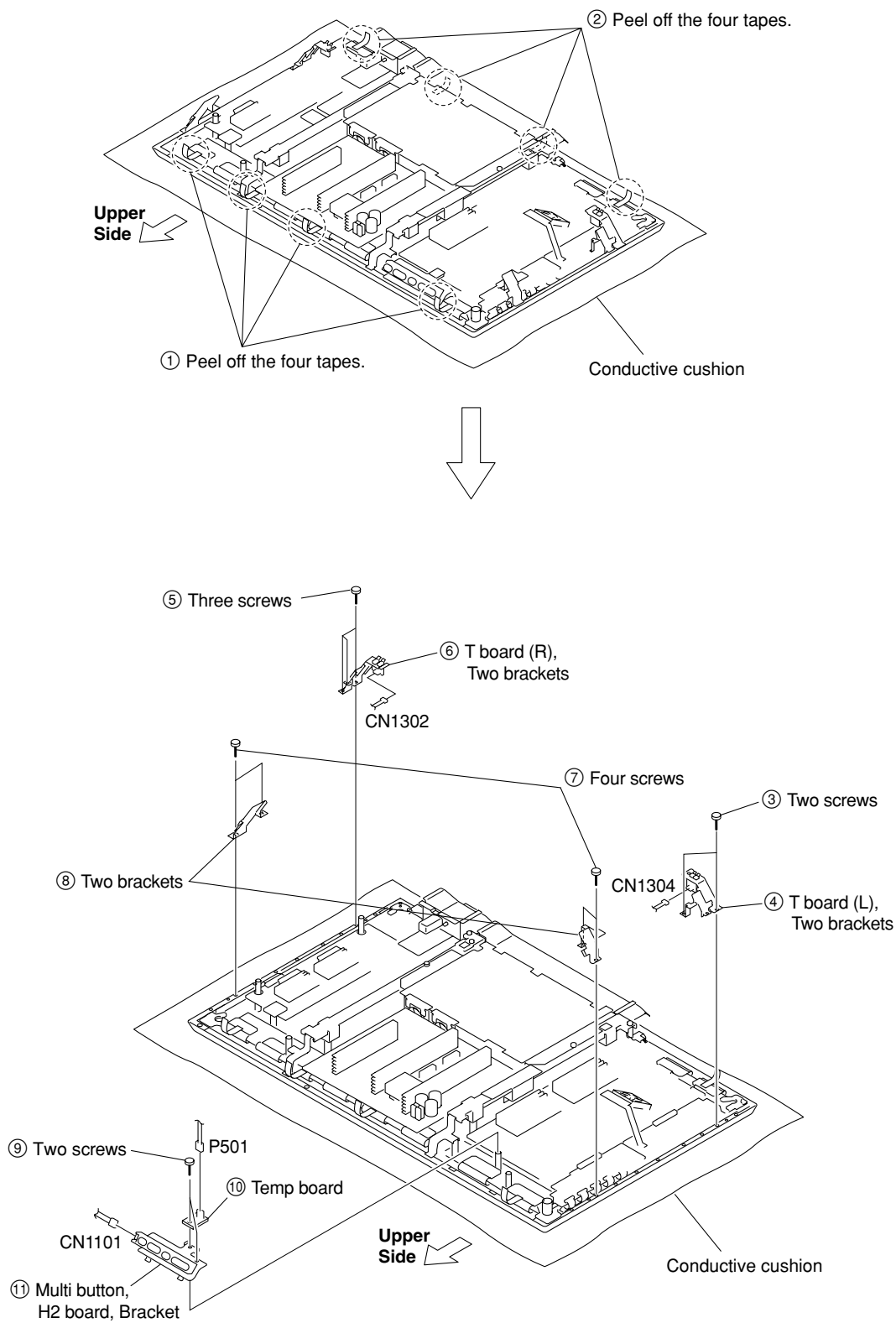
1-3-1. BKM-V10



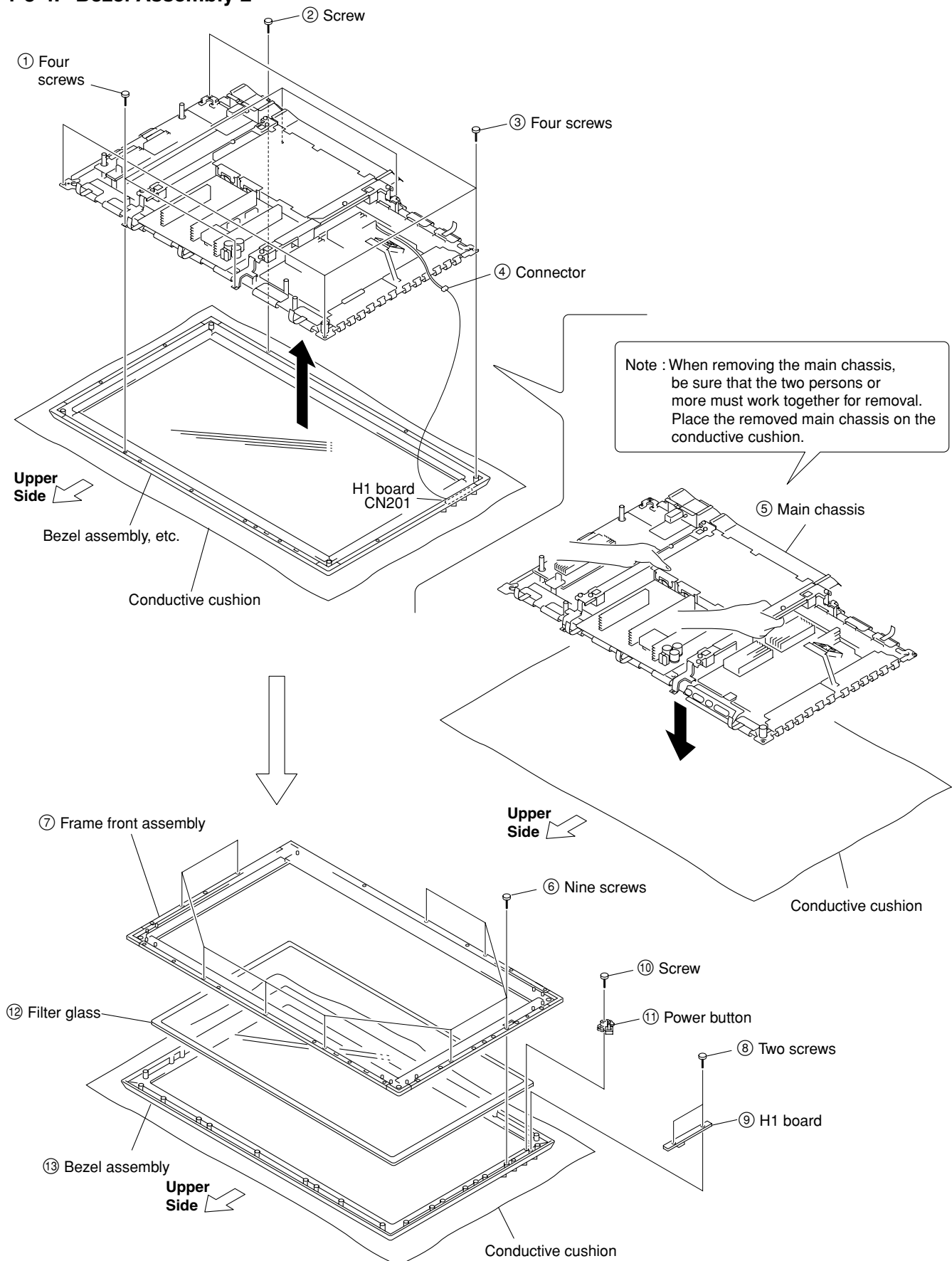
1-3-2. Rear Cover Assembly



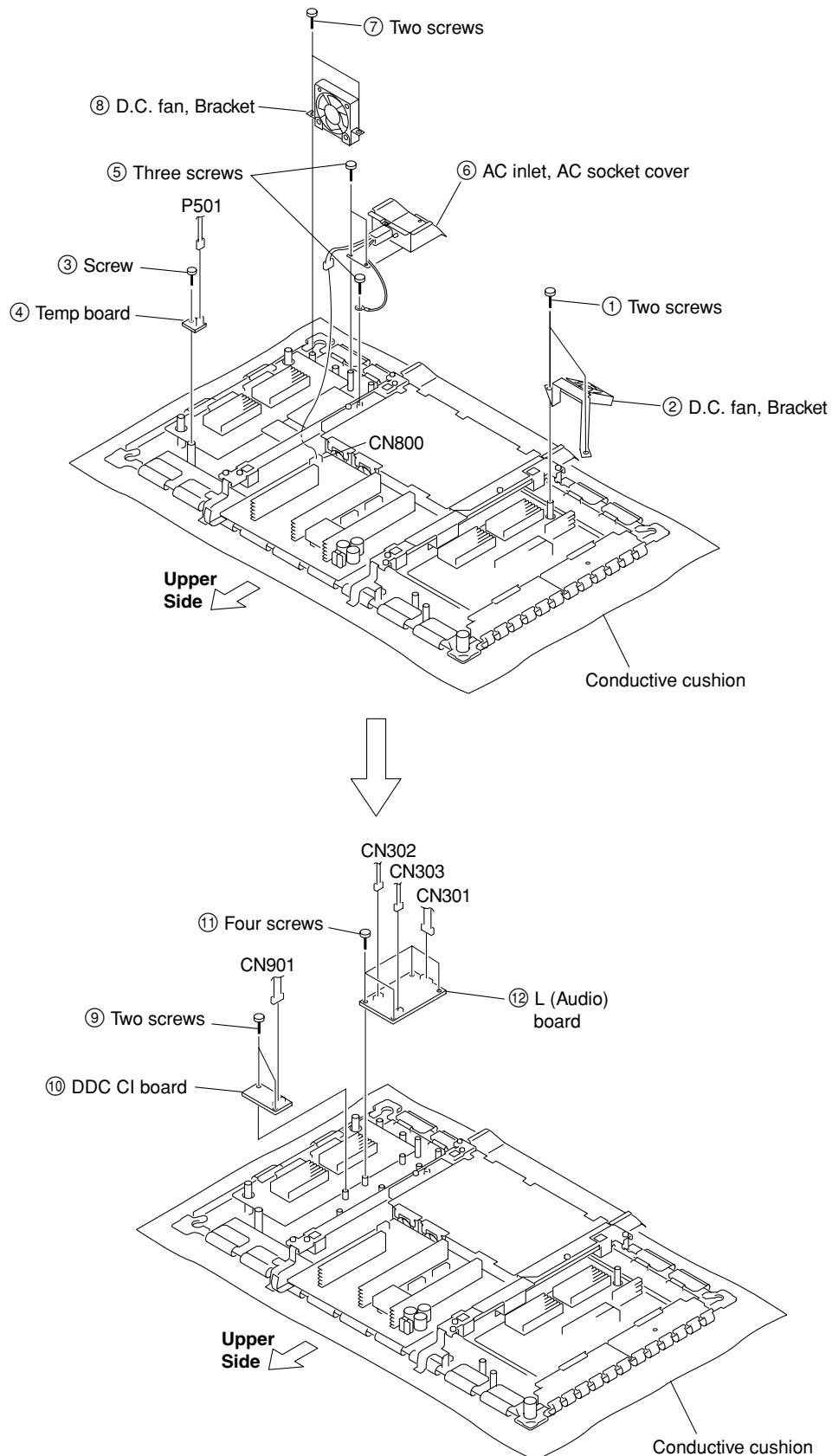
### 1-3-3. Bezel Assembly 1



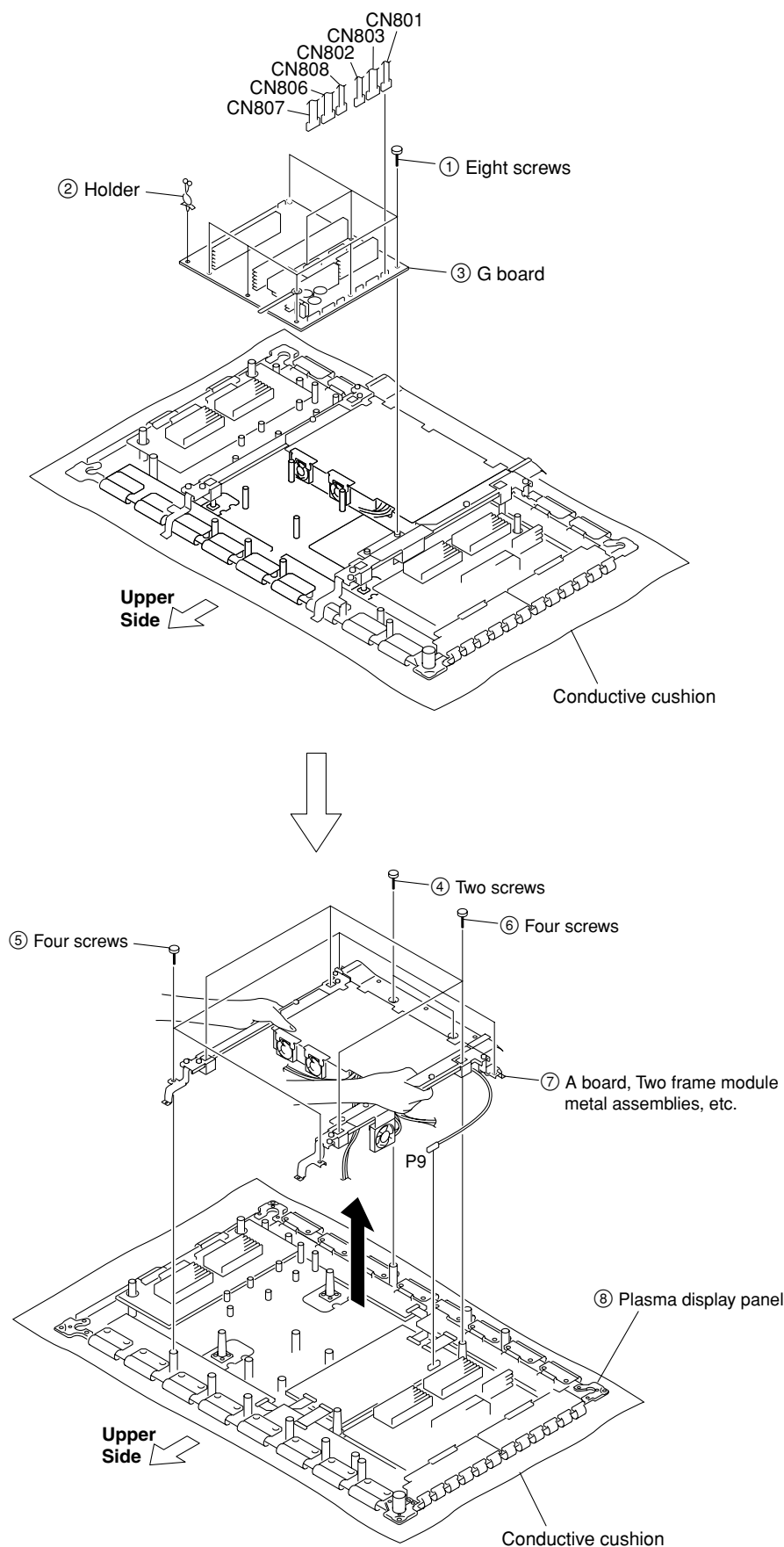
## 1-3-4. Bezel Assembly 2



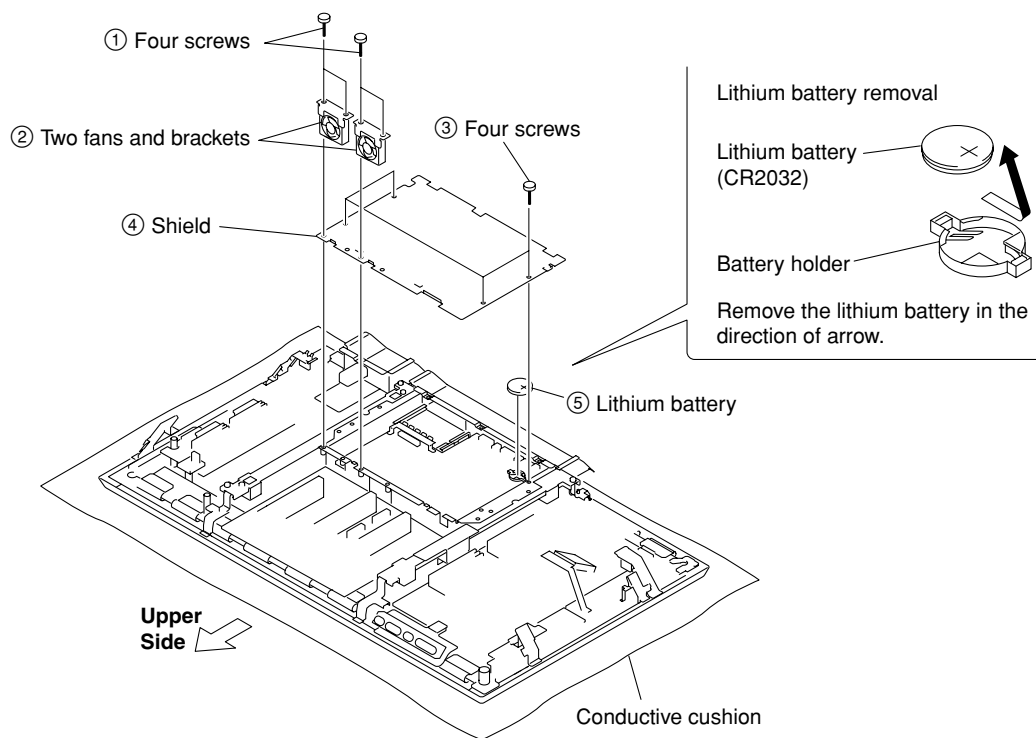
## 1-3-5. Plasma Display Panel 1



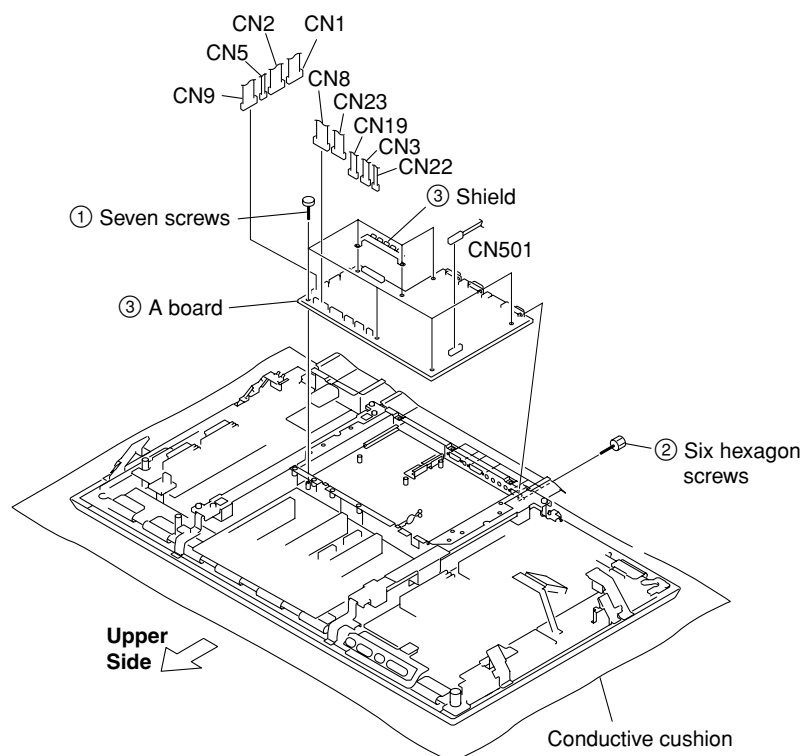
1-3-6. Plasma Display Panel 2



### 1-3-7. Litium Battery

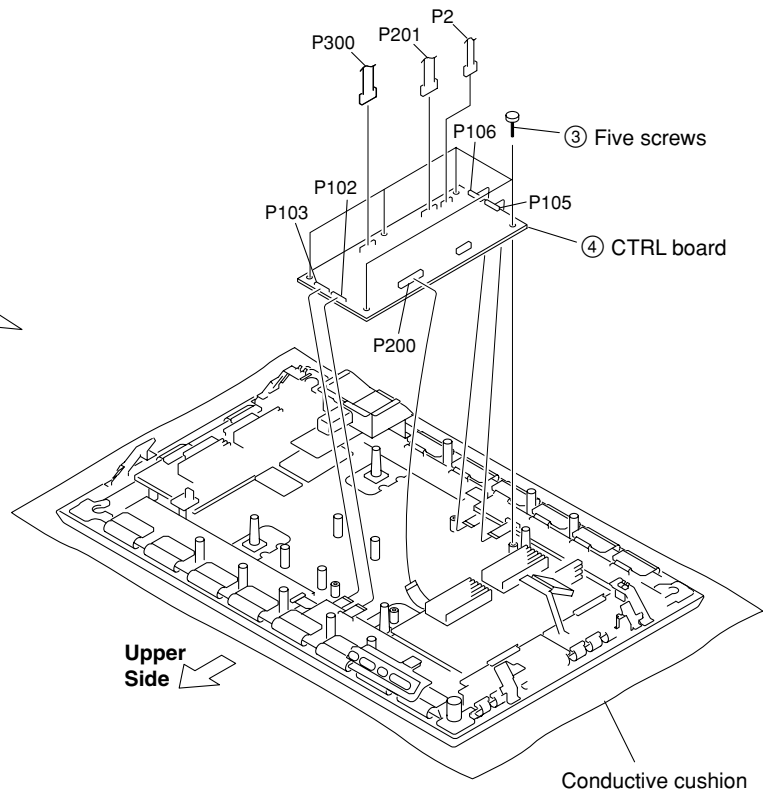
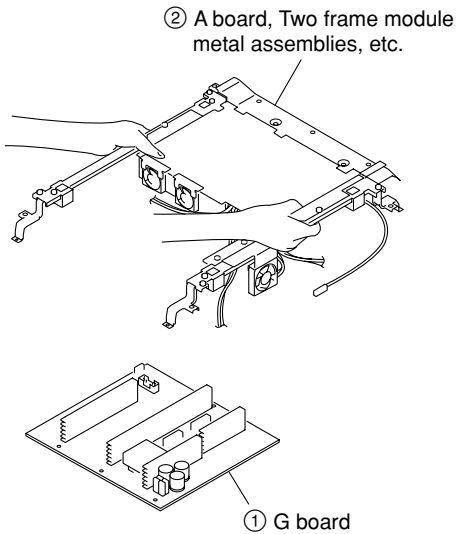


### 1-3-8. A Board



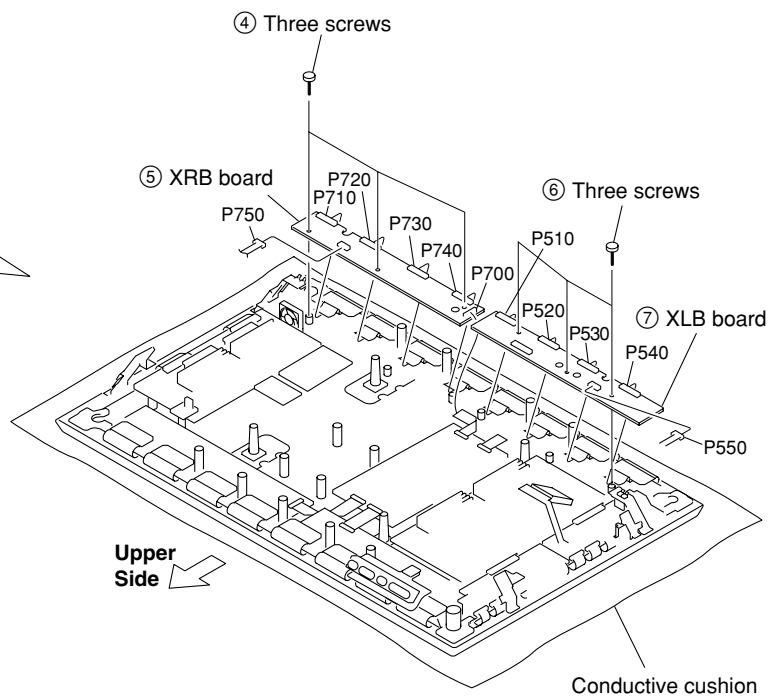
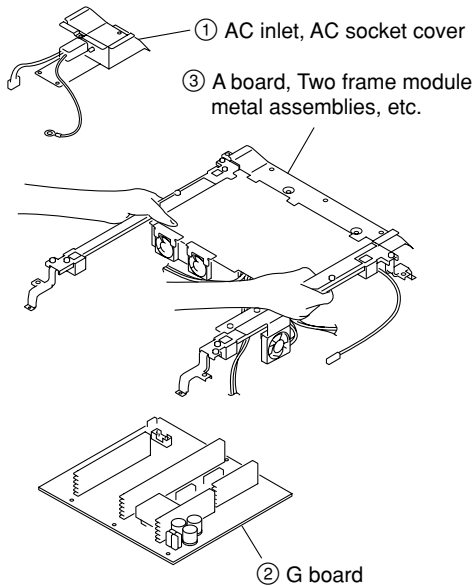
### 1-3-9. CTRL Board

For removal procedure, refer to  
"Plasma Display Panel 2".



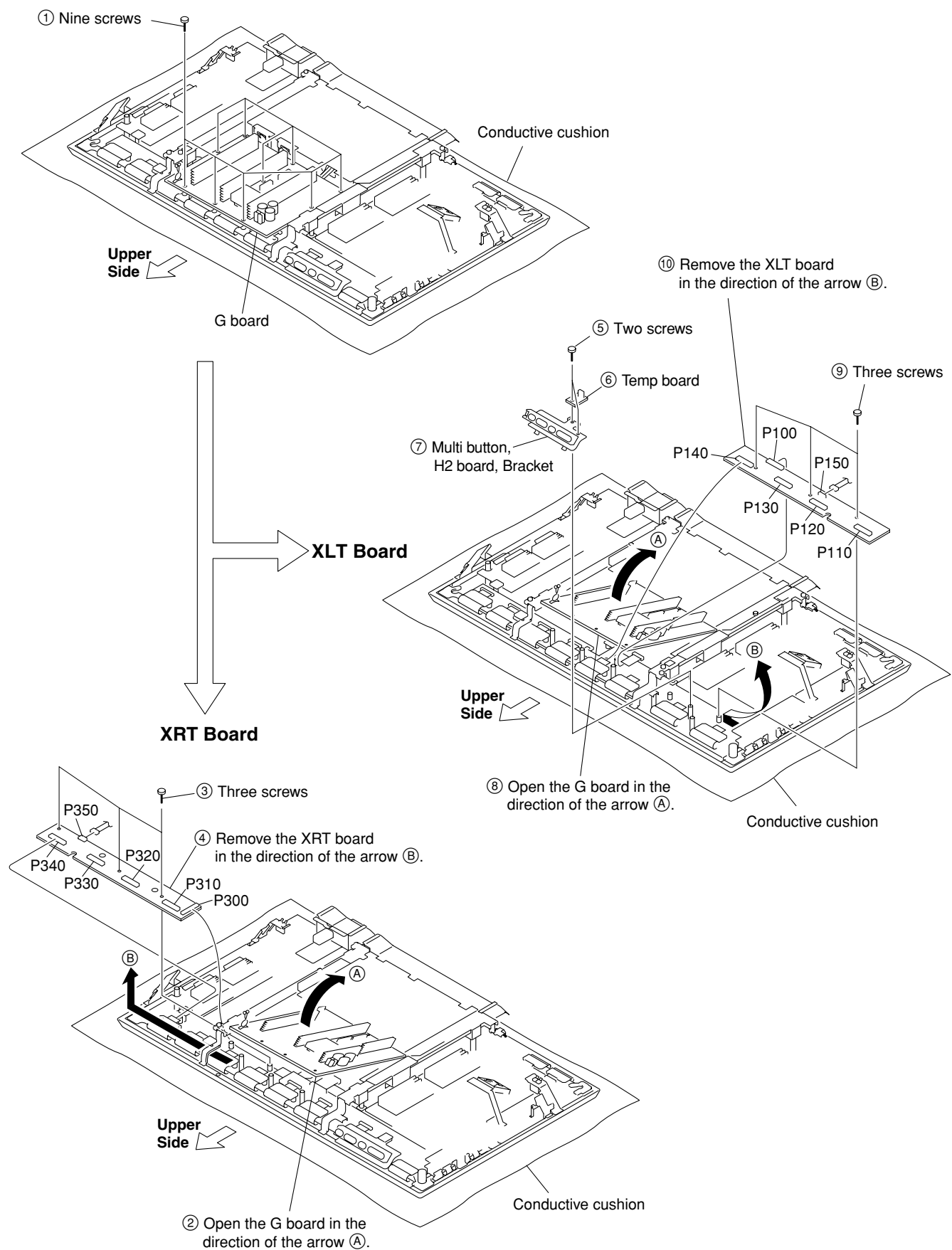
### 1-3-10. XRB Board and XLB Board

For removal procedure, refer to  
"Plasma Display Panel 1.2".

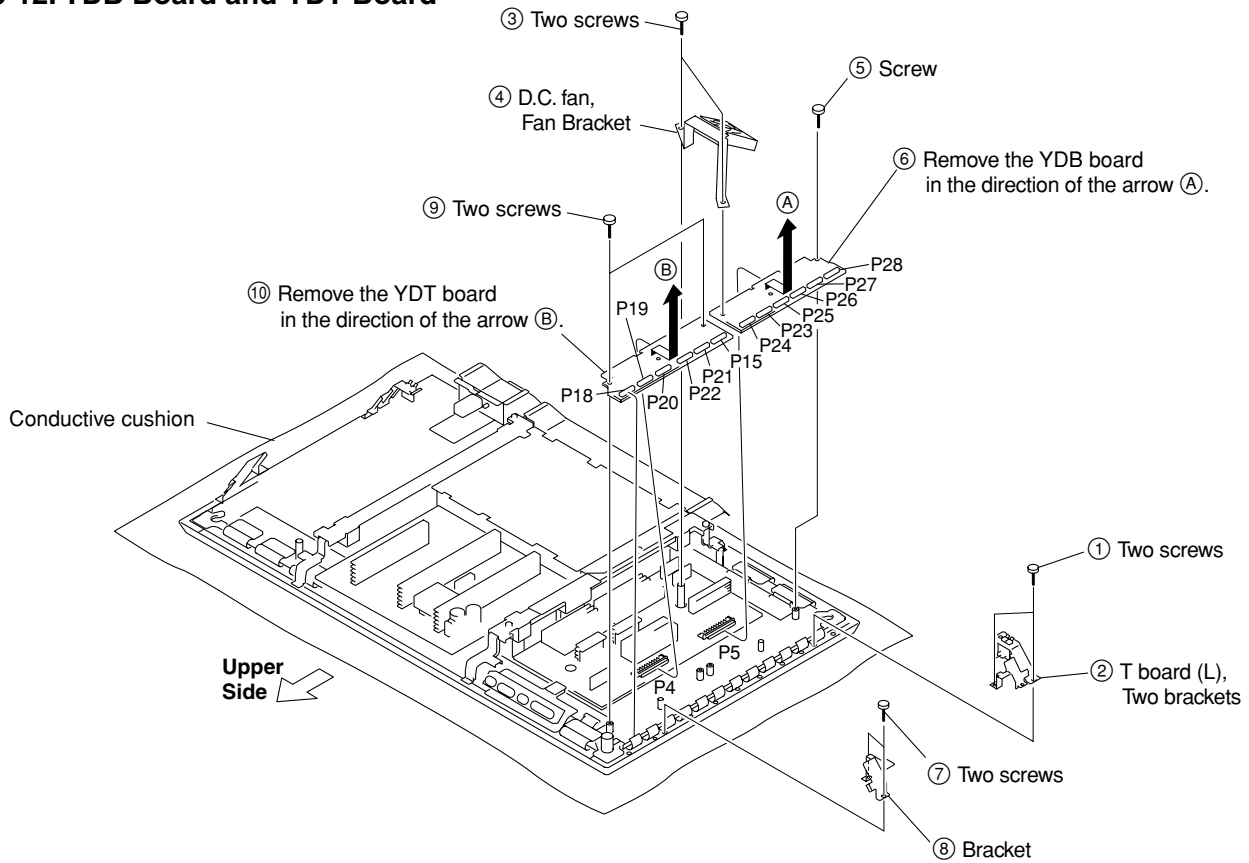




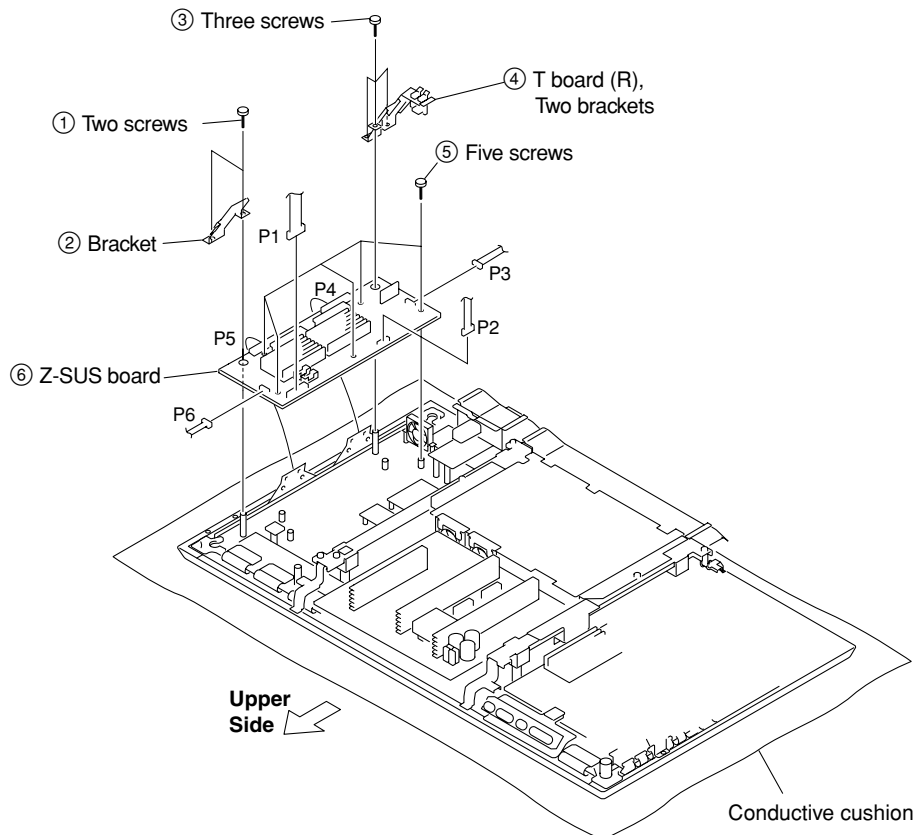
## 1-3-11. XRT Board and XLT Board



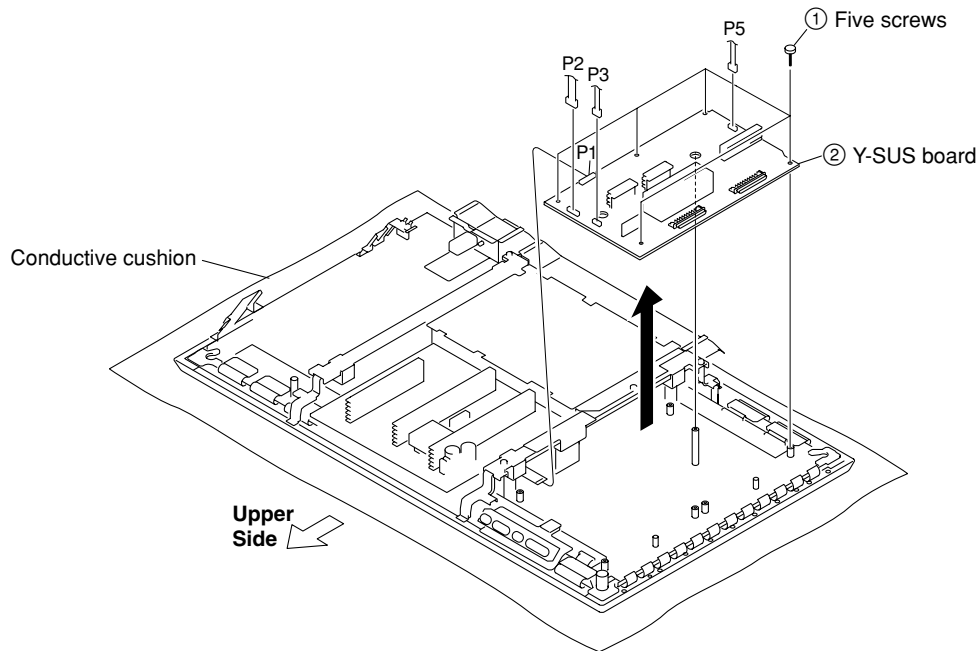
### 1-3-12. YDB Board and YDT Board



### 1-3-13. Z-SUS Board



### 1-3-14. Y-SUS Board



### 1-4. Warning on Power Connection

Use the proper power cord for your local power supply.

#### PFM-42X1 series

	United State, Canada	Continental Europe		United Kingdom, Ireland, Austria, New Zealand	Japan
Plug type	VM0233	COX-07	636	— a)	VM1296
Female end	VM0089	COX-02	VM0310B	VM0303B	VM1313
Cord type	SVT	H05VV-F		CEE (13) 53rd (O, C)	HVCTF
Minimum cord set rating	10A/125V	10A/250V		10A/250V	10A/125V
Safety approval	UL/CSA	VDE		VDE	DENAN-HO

a) Note : Use an appropriate rating plug which complies with local regulations.



## Section 2

### Electrical Adjustment

#### 2-1. Setup Adjustment

- Required equipments

Remote commander (RM-971)

Digital voltmeter

Luminance meter : Minolta CA-110 or equivalent

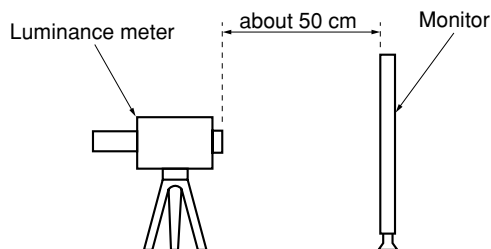
If Minolta CA-110 or equivalent is not available, make adjustment by comparing the monitor with the reference LCD monitor that has already been calibrated correctly.

Signal generator : VG-854 or equivalent

- Preparation of the luminance meter

Place the light receptor block of the luminance meter about 50 cm away from the monitor screen as shown.

##### 1. How to enter the service mode



- 1) Turn on the power.
- 2) Input Enter → 1 → 8 → 2 from the remote controller in this order to display SERVICE MODE OSD.
- 3) Select INITIALIZATION menu, and execute FILL 0xFF.  
(When the initialization is completed, the power turns off and restarts automatically.)

##### Note

W/B readjustment is required after the panel, board or microprocessor is replaced. However, before W/B adjustment, be sure to perform aging for more than 30 minutes after RGB reset.

##### 2. Setup

- 1) Set the timing and pattern data for the signal generator according to the Sony timing specifications.
- 2) Connect the monitor video cable to the signal generator.

- 3) Place the luminance meter (e.g. CA-110) 50 cm away from the monitor. Align it with the vertical center of the display, and adjust the focus to the optimum level by using an eyepiece.
- 4) Place the monitor and the luminance meter (e.g. CA-110) in a light-shielded room for adjustment.
- 5) Set up [SERVICE MODE] of the monitor.

##### 3. Operation

For quick setup, set the data manually. Set Brightness, Contrast, and Backlight to 50, 70, and 100 respectively. Then, set the color temperature by adjusting its default value.

##### 4. Warm up time

Warm up for 30 minutes or more before performing any adjustment.

#### 2-2. White Balance Adjustment

##### 2-2-1. Initialization

- 1) Input Enter → 1 → 8 → 2 from the remote controller in this order to display SERVICE MODE OSD.
- 2) Select INITIALIZATION menu and, execute FILL 0xFF. (When the initialization is completed, the power turns off and restarts automatically.)

##### 2-2-2. AD Calibration

Execute Auto Calibration as follows by using a PC (1024 × 768 60 Hz) signal.

##### 1. PC signal

- 1) Display SERVICE MODE OSD and select the AD CALIBRATION menu.
- 2) Input Full Black (no video) pattern.
- 3) Execute PC. CUTOFF.
- 4) Input Full White pattern.
- 5) Execute PC.GAIN.

## 2-2-3. White Balance Adjustment

After aging the unit about 30 minutes, adjust the color matrix of each one of the color temperatures of 11000 K, 9300 K, and 6500 K as follows.

### 1. Preparation of adjustment

- 1) Equipment : Signal generator (e.g. : VG-854), luminance meter (e.g. : CA-110)
- 2) Signals type : If a detailed timing is needed, refer to Sony Timing Specifications.  
PC XGA (1024 × 768 60 Hz)  
1080I (Y/Pb/Pr)  
480P (Y/Pb/Pr)  
NTSC Composite  
PAL Composite  
480I (NTSC Composite)  
575I (PAL Composite)
- 3) Signal level : 700 mVpp
- 4) Signal pattern : Full White, 16-step gray pattern

### 2. Color matrix adjustment

Execute the following programs in the following sequence : PC → 1080i → 480p → 480i → 575i → NTSC Composite → PAL Composite.

- 1) After inputting each signal, adjust Sub-Offset.
  - Input 16-step gray pattern.
  - Display SERVICE MODE OSD and select the WHITE BALANCE menu.
  - Change Sub-Offset, and adjust the brightness of the second step of the 16 steps of gray to be 0.5 cm/m<sup>2</sup> or less.  
(Sub-Offset : ±0.1)
- 2) Input Full White pattern.
- 3) Set the values of R-GAIN and R/G/B-OFFSET in the WHITE BALANCE menu as shown in the following figure.

	PC	1080I	480P	480I	575I	NTSC	PAL
R-GAIN	33	34	34	34	34	34	34
R-OFFSET	61	51	51	52	51	57	53
G-OFFSET	60	53	52	52	52	62	57
B-OFFSET	63	52	51	52	51	60	55

- 4) Adjust the color matrix by changing the values of G-GAIN and B-GAIN. (Refer to SONY Color Matrix Specifications)  
11000 K : x=276 (±15), y=282 (±15)  
9300 K : x=283 (±15), y=298 (±15)  
6500 K : x=313 (±15), y=329 (±15)
- 5) Adjust each of the color temperatures of 11000 K, 9300 K, and 6500 K by repeating steps 3) and 4).

## 2-2-4. Shipment Condition Setting

Set the shipment condition (Refer to SONY Color Matrix Specifications.).

- 1) Display the SERVICE MODE OSD menu.
- 2) Select the FOR TEST menu, and execute INIT GOODS.  
(When INIT GOODS is completed, the power turns off and restarts automatically.)

## 2-3. Panel Adjustment

### 2-3-1. Application Object

This standard is applied to the PDP42X1##7# PDP Module, which is manufactured by the manufacturing team of PDP promotion department or elsewhere.

### 2-3-2. Notes

- 1) Without any special indication, the module should be at the preliminary condition more than 10 minutes before adjustment.
  - Service signal : 100% Full White signal
  - Service DC voltage :  $V_{cc} : 5\text{ V}$ ,  $V_a : 65\text{ V}$ ,  $V_s : 190\text{ V}$
  - DC/DC Pack voltage :  $V_{1st} : 115\text{ V}$ ,  $V_{scw} : 110\text{ V}$ ,  
 $-V_y : -175\text{ V}$ ,  $V_{zb} = 105\text{ V}$
  - Preliminary environment : Temperature ( $25 \pm 5^\circ\text{C}$ ),  
relative humidity ( $65 \pm 10\%$ )
- 2) After assembling the module, perform aging under the following conditions for stabilizing its operation before starting the adjustment.
  - Service signal : 100% Full White, Red, Green, Blue pattern signals (Service time of each pattern : within 5 minutes/cycle)
  - Service DC voltage : Match the voltage with the setup voltage at the first adjustment.
  - Aging period : 4 hours or more
  - Aging environment : Temperature ( $60 \pm 2^\circ\text{C}$ ),  
relative humidity 75% or less
- 3) Module adjustment should be performed in the following sequence.
  - Set the initial voltage and adjust the voltage waveform of Vsetup.
  - Measure the margin of the  $V_s$  voltage and determine the voltage.
  - Adjust and check the voltage of DC/DC pack ( $V_{1st}$ ,  $V_{sc}$ ,  $-V_y$ ,  $-V_{zb}$ ).
  - Adjust the voltage waveform of Vset-down.
  - Measure the margin of the Vset-up voltage and determine the voltage.
  - Adjust the waveform of the final voltage. The adjustment value above may vary depending on individual units.
- 4) Without any special indication, adjust the module under the ambient temperature of  $25 \pm 5^\circ\text{C}$  and the relative humidity of  $65 \pm 10\%$ .

#### CAUTION

If you leave the still image displayed for more than 10 minutes (especially the digital pattern or cross hatch pattern, which has a clear gradation), afterimage may remain in the black level part of screen.

## 2-3-3. Adjustment Items

### 1. Adjusting the board group

- 1) Adjusting the voltage waveform of Vset-up
- 2) Adjusting the voltage waveform of Vset-down
- 3) Adjusting the voltage waveform of  $V_{zb}$

### 2. Adjustment after assembling (PDP module adjustment)

- 1) Set the initial voltage and adjust the voltage waveform of Vsetup.
- 2) Measure the margin of  $V_s$  voltage and determine the voltage.
- 3) Adjust and check the voltage of DC/DC pack ( $V_{1st}$ ,  $V_{sc}$ ,  $-V_y$ ,  $-V_{zb}$ ).
- 4) Adjust the voltage waveform of Vset-down.
- 5) Measure the margin of the Vset-up voltage and determine the voltage.
- 6) Adjust the waveform of the final voltage.

## 2-3-4. Adjusting the Board Group (Applying the Tools)

### 1. Required tools

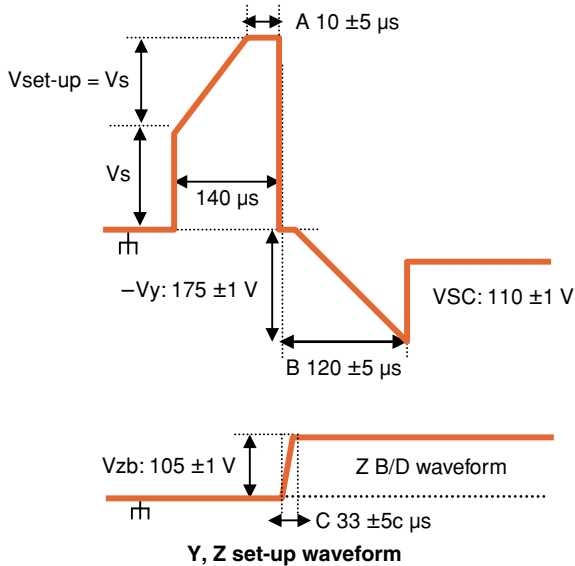
- 1) Digital oscilloscope : 200 MHz or more
- 2) DVM (Digital Multimeter) : Fluke 87 or equivalent
- 3) Signal generator : VG-854 or equivalent
- 4) DC power supply
  - DC power supply for  $V_s$  (1) : Should be changeable more than 0-200 V/ more than 10 A.
  - DC power supply for  $V_a$  (1) : Should be changeable more than 0-100 V/ more than 5 A.
  - DC power supply for 5 V (1) : Should be changeable more than 0-10 V/ more than 10 A.
  - DC-DC converter tool (1) : The tool that can output the voltage equivalent to that of the PDP42x1##7# module by using the  $V_s$ ,  $V_a$ , or 5 V voltage.
  - Voltage stability of the power supply : Within  $\pm 1\%$  for  $V_s/V_a$ , within  $\pm 3\%$  for 5 V

### 2. Connection diagram of the measuring instrument and setting up the initial voltage

- 1) Connection diagram of measuring instrument  
Refer to Fig. 1 (Connection diagram of measuring instrument that adjusts the voltage waveform).
- 2) Setting up the initial voltage  
Initial-setup voltage :  $V_{cc} : 5\text{ V}$ ,  $V_a : 65\text{ V}$ ,  $V_s : 190\text{ V}$   
Adjust, the initial-setup voltage within the setup range according to the module's characteristics.

### 3. How to adjust

- 1) Adjusting the voltage waveform of Vsetup
  - ① Connect the measuring instrument as shown in the connection diagram Fig. 1.
  - ② Turn on the power of the measuring instrument as described in **CAUTION** under Fig. 1.
  - ③ Connect the oscilloscope probe to the P4 connector (80-pin) of Y-SUS PCB and GND.
  - ④ Turn the VR1 of Y-SUS PCB to adjust the waveform "A" in the following figure to be  $10 \pm 5 \mu\text{s}$ .
- 2) Adjusting the Vset-down voltage waveform
  - ① Turn the VR2 of Y-SUS PCB to adjust the waveform "B" in the following figure to be  $120 \pm 5 \mu\text{s}$ .
- 3) Adjusting the VzB voltage waveform
  - ① Turn the VR2 of Z-SUS PCB to adjust the waveform "C" in the following figure to be  $33 \pm 5 \mu\text{s}$ .



### 2-3-5. Adjustment after Assembling (PDP Module Adjustment)

#### 1. Required Tools

- 1) Digital oscilloscope : 200 MHz or more
- 2) DVM (Digital multimeter) : Fluke 87 or equivalent
- 3) Signal generator : VG-854 or equivalent
- 4) DC power supply
  - DC power supply for  $V_s$  (1) : Should be changeable more than 0-200 V/ more than 10 A.
  - DC power supply for  $V_a$  (1) : Should be changeable more than 0-100 V/ more than 5 A.
  - DC power supply for 5 V (1) : Should be changeable more than 0-10 V/ more than 10 A.
  - DC-DC converter tool (1) : The tool that can output the voltage equivalent to that of the PDF42x1##7# module by using the  $V_s$ ,  $V_a$ , or 5 V voltage.
  - Voltage stability of the power supply : Within  $\pm 1\%$  for  $V_s/V_a$ , within  $\pm 3\%$  for 5 V.

#### 2. Connection diagram of the measuring instrument and setting up the initial voltage

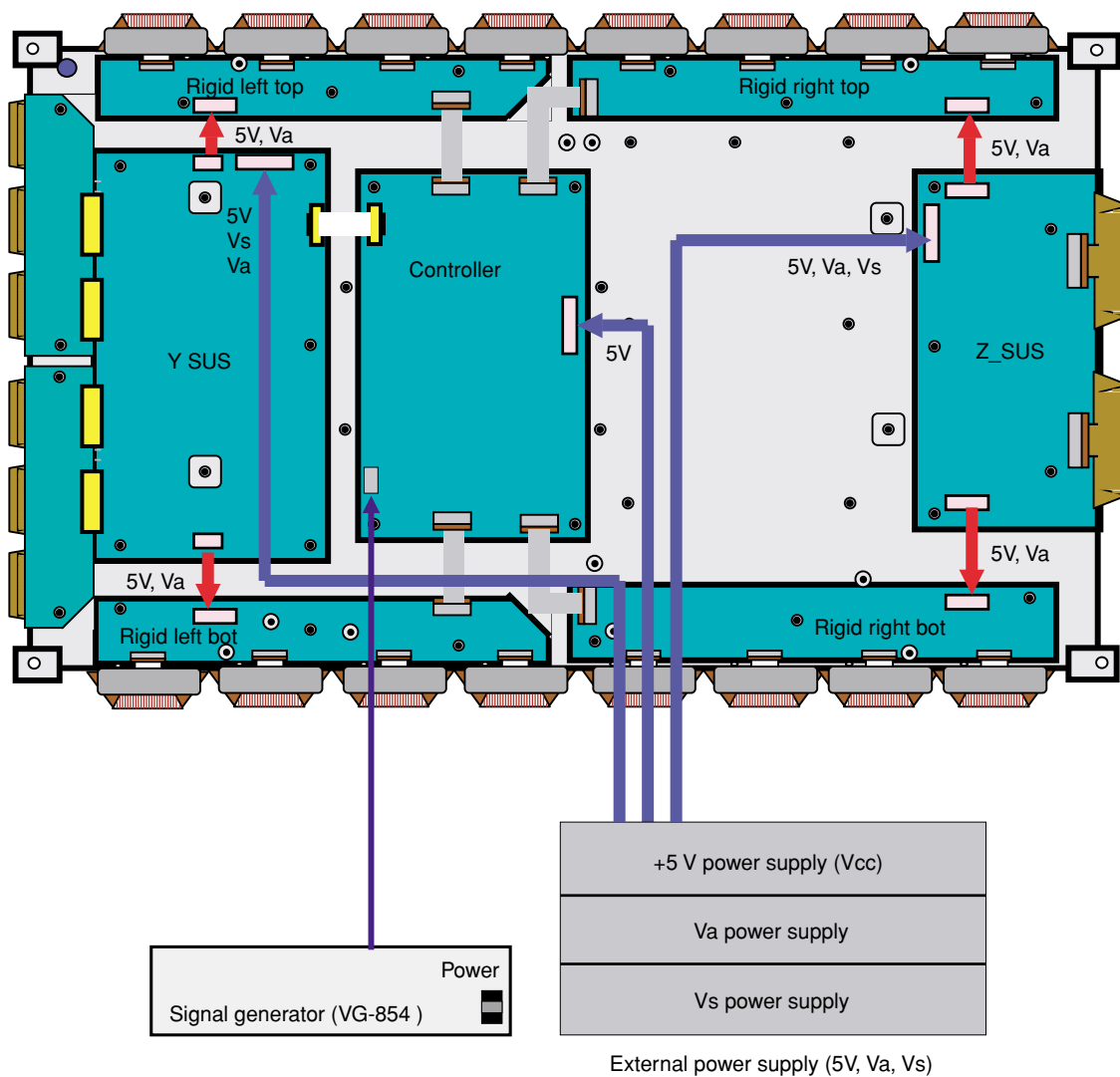
- 1) Refer to fig 1. (Connection diagram of measuring instrument that adjusts the voltage waveform).
- 2) Initial-setup Voltage :  $V_{\text{CC}} : 5 \text{ V}$ ,  $V_a : 65 \text{ V}$ ,  $V_s : 190 \text{ V}$   
Adjust the initial-setup voltage within the setup range according to the module's characteristics.

#### 3. How to adjust

- 1) Adjusting the initial voltage waveform  
Check the voltage waveform by following the steps in 2-3-4 (3. How to adjust), and readjust the waveform when it is out of range.
- 2) Checking the DC/DC pack voltage
  - ① Switch the signal of the signal generator to the 100% Full White signal.
  - ② Connect the GND probe of DVM to the R16's right leg of the Y B/D, and connect the positive probe to the left leg of R30 to check the V1st voltage ( $115 \pm 1 \text{ V}$ ). When there is abnormality in the voltage, turn the variable resistor PS1 of DC/DC Pack (V1st) on Y B/D to adjust it.
  - ③ Connect the GND probe of DVM to P4 of the Y B/D, and connect the positive probe to the lower leg of R37 (or R50) to check the Vsc voltage ( $115 \pm 1 \text{ V}$ ). When there is abnormality in the voltage, turn the variable resistor (PS3) of DC/DC Pack (Vsc) on Y B/D to adjust it.



- ④ Connect the GND probe of DMV to the GND of the Y B/D, and connect the positive probe to the lower leg of R44 to check the  $-V_y$  voltage ( $-175 \pm 1$  V). When there is abnormality in the voltage, turn the variable resistor (PS2) of DC/DC Pack ( $-V_y$ ) on Y B/D to adjust it.
  - ⑤ Connect the GND probe of DVM to the GND of the Z B/D, and connect the positive probe to the upper leg of B34 to check the  $V_{zb}$  voltage ( $-105 \pm 1$  V). When there is abnormality in the voltage turn the variable resistor (A2) of DC/DC Pack ( $-V_{zb}$ ) on Z B/D to adjust it.
- 3) Measuring the  $V_s$  voltage margin and determining the voltage
- ① Switch the signal of the signal generator to the 100% Full Red signal.
  - ② Turn the voltage adjusting knob of the  $V_s$  DC power supply in the voltage-down direction, and turn off the cells of the screen.
  - ③ Turn the voltage adjusting knob of the  $V_s$  DC power supply in the voltage-up direction until the cells of the screen turn on. The first voltage, which turns on the cells of the entire screen, is named as  $V_{smin1}$ . Record the value of  $V_{smin1}$ .
  - ④ Turn the voltage adjusting knob of the  $V_s$  DC power supply in the voltage-up direction slowly until the cells of the screen turn off or until over-electric discharge happens. The first voltage, which turns off the cells of the screen or causes over-electric discharge, is named as  $V_{smax1}$ . Record the value of  $V_{smax1}$ . (Note that the  $V_s$  voltage variable should exceed the maximum of 195 V.)
  - ⑤ Switch the signal of the signal generator to the 100% Full Green signal.
  - ⑥ Repeat the previous adjustment step (2), and record each voltage as  $V_{smin2}/V_{smax2}$ .
  - ⑦ Switch the signal of the signal generator to 100% Full Blue signal.
  - ⑧ Repeat the previous adjustment step (2), and record each voltage as  $V_{smin3}/V_{smax3}$ .
  - ⑨ Switch the signal of the signal generator to 100% Full White signal.
  - ⑩ Repeat the previous adjustment step (2), and record each voltage as  $V_{smin4}/V_{smax4}$ .
  - ⑪ Switch the signal of the signal generator to 100% Full Black signal.
  - ⑫ Repeat the previous adjustment step (2), and record each voltage as  $V_{smin5}/V_{smax5}$ .
- ⑬ At this time, the maximum voltage is set by adding 6 V to the  $V_s$  voltage ( $V_{smin1}$  to  $V_{smin5}$ ). Set the voltage within the setting range ( $180 \text{ V} < V_s \leq 195 \text{ V}$ ) while considering other characteristics as well.
- ⑭ Turn the voltage adjusting knob of the  $V_s$  DC power supply, and determine the  $V_s$  voltage.
- ⑮ Adjust the  $V_{set}$ -down waveform by setting the  $V_s$  voltage as described in 2-3-4.
- 4) Adjusting the final voltage waveform
- ① Check the voltage waveform as described in 2-3-4 (3. How to adjust), and readjust the waveform when it is out of range.
- 5) DC-DC Pack voltage setup range
- $V_{1st}$  : 100V to 160 V  
 $V_{sc}$  : 100 V to 160 V  
 $-V_y$  :  $-160 \text{ V}$  to  $-200 \text{ V}$   
 $-V_{zb}$  : 100 V to 160 V



**Fig. 1 Connection diagram of the measuring instrument**

**CAUTION**

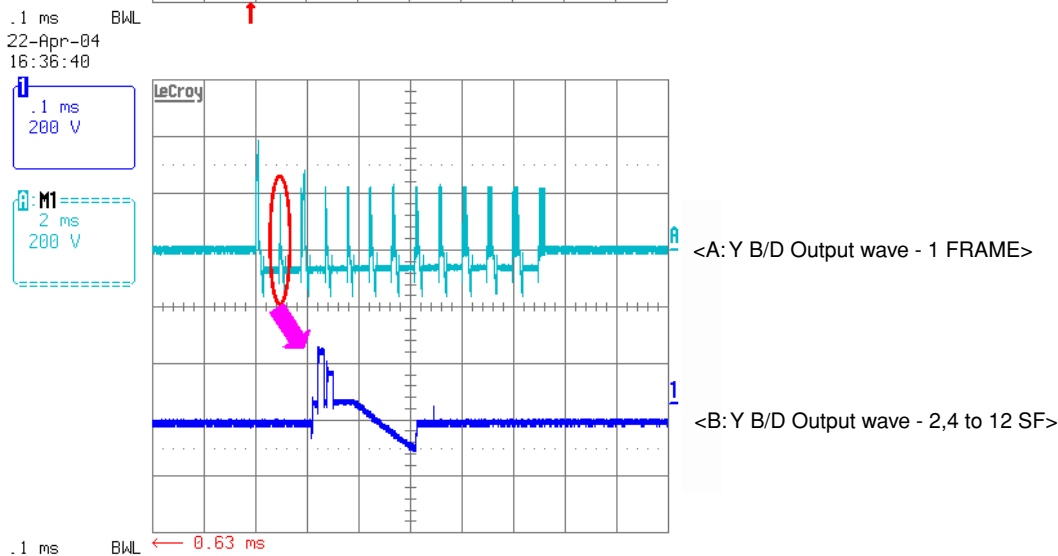
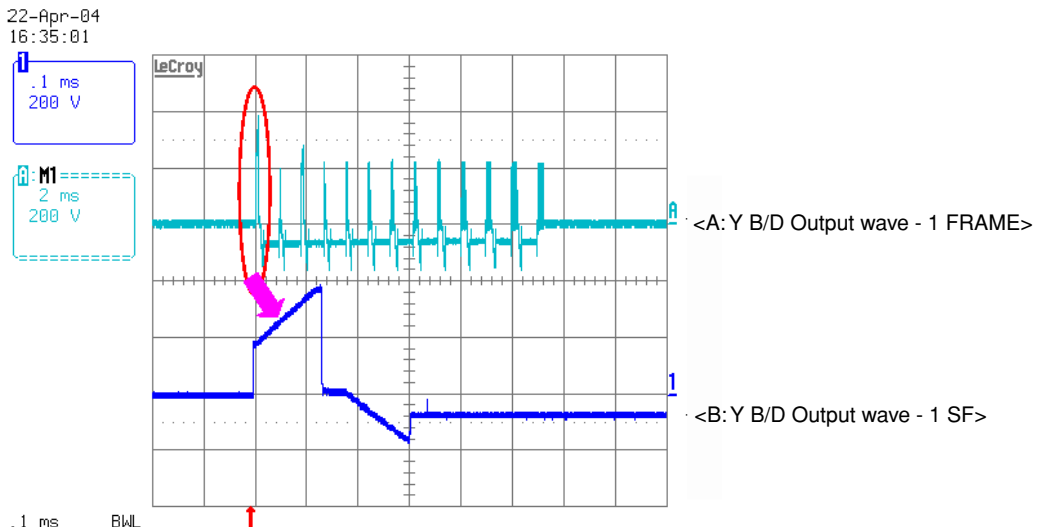
- 1) The power of the signal generator should be turned on before turning on the power of the DC power supply.
- 2) The voltage of the DC power supply should be preset as below in the same way as the standard module input voltage.  
Vcc : 5 V, Va : 65 V, Vs : 190 V
- 3) The power supply must be turned on in the following sequence. Reverse the sequence when turning off the power.  
\* Module on : 5 V → Va → Vs, Module off : Vs → Va → 5 V
- 4) Select the 1024 × 768 mode for the signal generator.

## 2-4. Troubleshooting

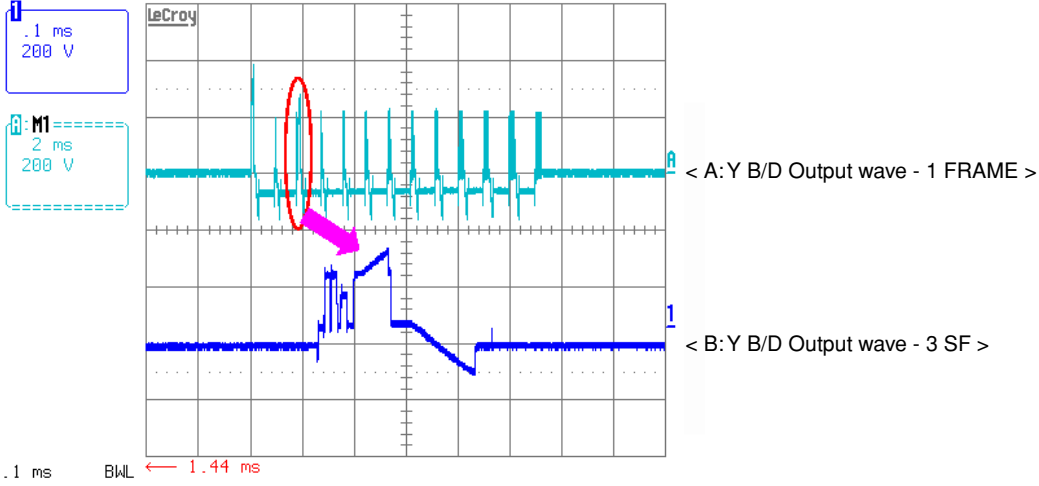
### 2-4-1. Checking for No Picture

Check the following points if the monitor shows the Full Black pattern or the power is off and no picture appears on screen.

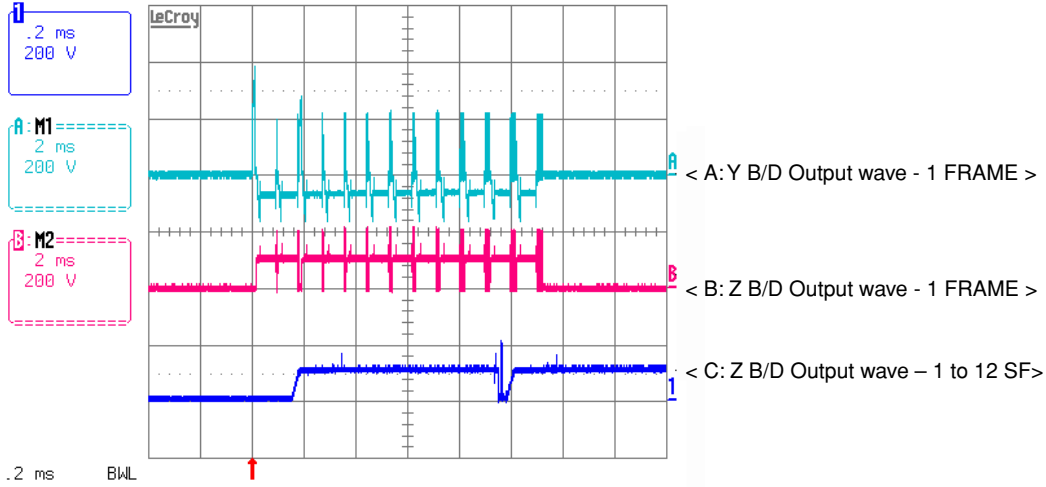
- 1) Check whether the CTRL B/D LED (D10, D11, D12, D13, D17) is turned on or not.
- 2) Check the power and signal cable of the CTRL B/D.
- 3) Check whether the X B/D, Y B/D, and Z B/D are plugged securely.
- 4) Check the connection of the X B/D, Y B/D and Z B/D to the CTRL B/D.
- 5) Measure the output wave of the X, Y, and Z B/D with the oscilloscope (200 MHz or more) and check if there is any problem on the boards by comparing the output wave with the following figure.
  - Measurement point for the Y B/D : TP (Bead B50)
  - Measurement point for the Z B/D : TP (Bead B35)
  - Measurement point for the X B/D : COF TP
- 6) Check the SCAN (Y side) IC.
- 7) Check the DATA (X side) COF IC.
- 8) Replace the CTRL B/D.



22-Apr-04  
16:38:25



22-Apr-04  
16:43:48



## 2-4-2. Hitch Diagnosis Based on the Display Condition

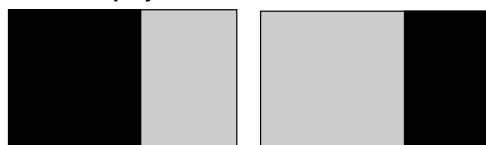
### 1. 4/7 or 3/7 of the screen is not displayed

- 1) Check if the power connector of the X B/D that corresponds to the screen portion with no picture is securely connected.
- 2) Check whether the connector that connects the CTRL B/D and the X B/D that correspond to the screen portion with no picture is securely connected.
- 3) Replace the corresponding X B/D.

### Relationship between the screen and X B/D

Screen		X B/D
Left 4/7 portion of the screen	↔	Right X B/D
Right 3/7 portion of the screen	↔	Left X B/D

#### Screen display forms



Left of the screen (4/7)      Right of the screen (3/7)

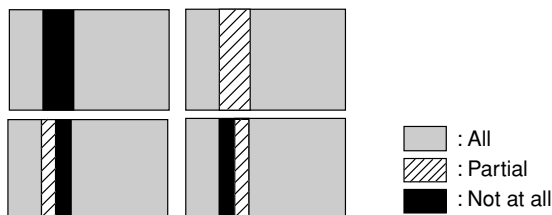


### 2. Data COF is not shown on screen (Including the case where a part of Data COF is not shown)

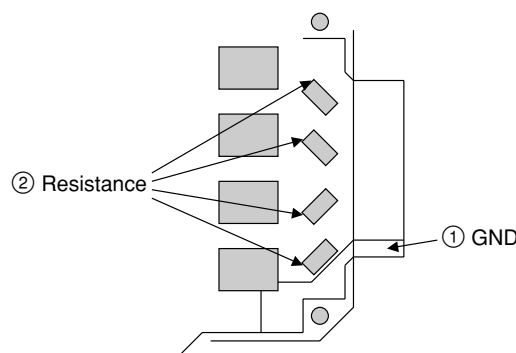
- 1) When Data COF is not shown, in many cases a problem resides between Data COF and the X B/D.
- 2) Check if the Data COF and the X B/D that correspond to the screen portion with no picture are securely connected.
- 3) Check if the Data COF is not damaged, and replace the X B/D.

#### Examples of the screen display form

(Any one of the 7 Data COF can be seen next to the below pictures.)



### How to examine Data COF IC

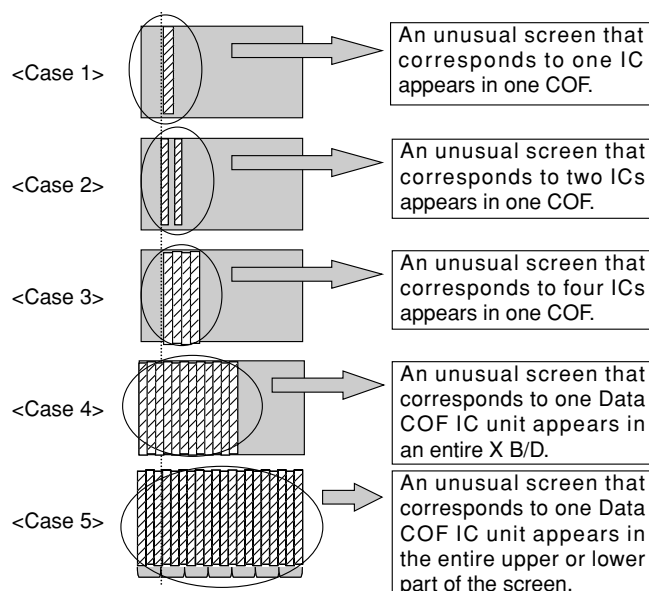


- Change “① GND” into ANODE, “② Resistance” into CATHODE, and then examine the diode in the forward or backward direction.
- Measure the resistance value (10 Ω).

### 3. An unusual pattern corresponding to the Data COF IC unit is shown

- 1) If an unusual pattern corresponding to the Data COF IC unit is displayed as shown below, the input to the Data COF IC has a problem.
- 2) In the case of <Case 1, 2, 3>
  - Check the connection of the Data COF connector.
  - Replace the corresponding X B/D.
- 3) In the case of <Case 4, 5>
  - Check the connector that connects the CTRL to the X B/D.
  - Replace the corresponding XB/D or CTRL B/D.

#### Screen display forms



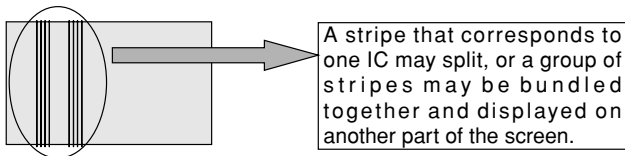
#### 4. Regular stripes that correspond to the area of one or more DATA COF ICs are displayed

- 1) If the stripes that correspond to the area of one Data COF IC are displayed regularly, the output from the output platform of the X B/D has a problem.  
If the stripes that correspond to the area of two Data COF ICs are displayed regularly, the data from the CTRL B/D is not transmitted correctly.
- 2) Check if the connection connector of the X B/D that corresponds to the unusual screen is connected securely.
- 3) Replace the corresponding XB/D or CTRL B/D.

#### Relationship between the screen and X B/D

Screen		X B/D
Left 4/7 portion of the screen	↔	Right X B/D
Right 3/7 portion of the screen	↔	Left X B/D

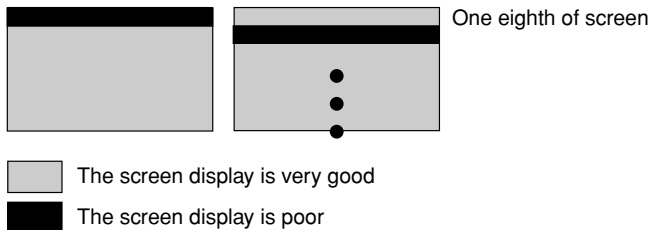
#### Screen display form



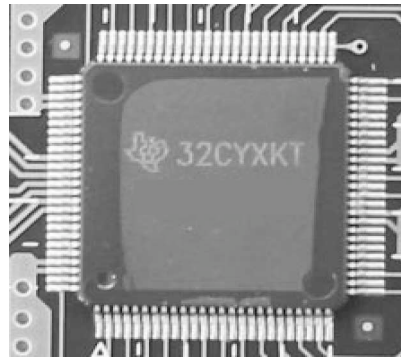
#### 5. The scan FPC has a problem for screen display.

- 1) There may be a problem between the Scan FPC and Y B/D.
- 2) Check the connection between the Y B/D and Scan FPC.
- 3) If the Scan IC has a failure, replace the Y DRV B/D.

#### Screen display forms



#### Checking method of SCAN IC

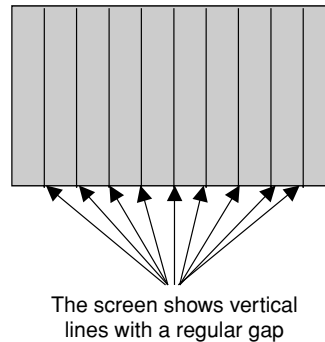


Change the Vpp pin into ANODE and GND pin into CATHODE, and then test the diode in the forward or backward direction.

#### 6. The screen has vertical lines with a regular gap. (A vertical stripe flashes in a specific color)

- 1) The control B/D has a problem.
- 2) Replace the control B/D.

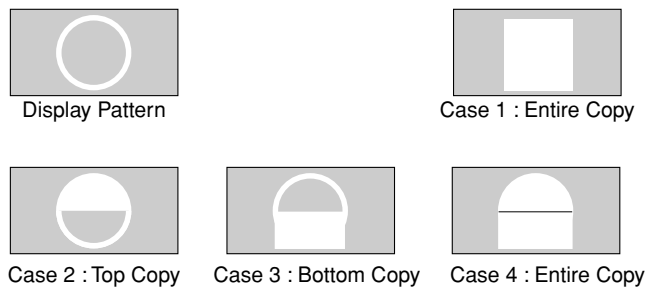
#### Screen display form



#### 7. A data copy occurs in the vertical direction.

- 1) This is due to the incorrect marking of a scan wave.
- 2) Replace the Y DRV B/D or Y SUS B/D.

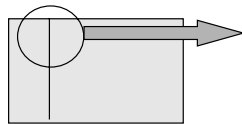
#### Screen display forms



### 8. The screen shows one or several vertical lines

- 1) This is not the problem of the controller B/D or XB/D.
- 2) It may be due to following reasons.
  - The panel has a failure.
  - The DATA COF FPC that is attached to the panel is open or shorted.
  - The DATA COF that is attached to the panel has a failure.
- 3) Replace the module.

Screen display form

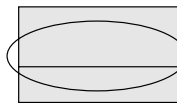


Several vertical lines appear in the quarter or another portion of the screen as the case shown on the left.

### 9. The screen has one or several horizontal lines

- 1) This is not the problem of the controller B/D or XB/D.
- 2) It may be due to one of the following reasons.
  - The panel has a failure.
  - The SCAN FPC that is attached to the panel is open or shorted.
  - The SCAN IC that is attached to the panel has a failure.
- 3) Replace the Y DRV B/D

Screen display form



Several horizontal lines may appear as the case shown on the left.

### 10. The screen displays an input signal pattern but the brightness is low

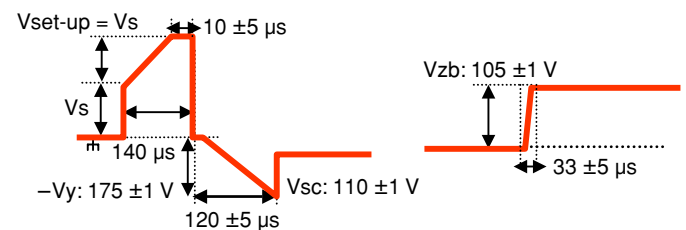
- 1) In this case, the Z B/D operation has a failure.
- 2) Check the power cable of the Z B/D.
- 3) Check the connector that connects the Z B/D and controller B/D.
- 4) Replace the controller B/D or Z B/D.

### 11. Another color may appear partially in the full white screen, or a signal appears on the full black screen

- 1) Check the inclination of the waveform at the Y B/D setup, and reduce the waveform.
- 2) Check the inclination of the Z B/D ramp wave.
- 3) Measure each output waveform with the oscilloscope (200 MHz or more) and compare the data with the data shown in the following figure.

Adjust the Y B/D setup (Test-up : B/C[ $\mu$ s/ $\mu$ s]), setdown (Test-down : D[ $\mu$ s]) and Z B/D ramp (Tramp : F/G[ $\mu$ s/ $\mu$ s]) inclination by changing VR1/VR2/VR3.

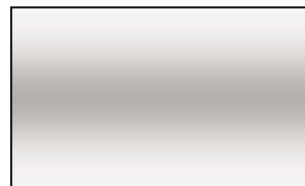
- Measuring point of the Y B/D : B50 (SUS\_UP)
- Measuring point of the Z B/D : B35 (SUS\_OUT)



### 12. A center of the screen is darker than the edges at full white pattern

- 1) The Z B/D has a failure.
- 2) Check the connection cable between the Z B/D and CTRL B/D.
- 3) Replace the Z B/D.

Screen display form



### 13. A specific color does not have a specific brightness.

- 1) Check the connector of the CTRL B/D input signal.
- 2) Replace the CTRL B/D.

## 2-4-3. Checking for Component Damage

### 1. Y IPM (IC100, 101) or Z IPM (IC4, 5) damage

- When the internal Sustain\_FET of Y IPM or ZIPM is damaged, the screen is not displayed or electric discharge occurs.
  - Test point : GND to B50 (Y B/D), GND to B35 (Z B/D).
  - Waveform : B50 (Y B/D) or B35 (Z B/D) has no wave output.
- When the internal ER\_FET of Y IPM or Z IPM is damaged, Y IPM or Z IPM emission increases.
  - Test point : GND to B50 (Y B/D), GND to B35 (Z B/D).
  - Waveform : As shown in Fig. 2.

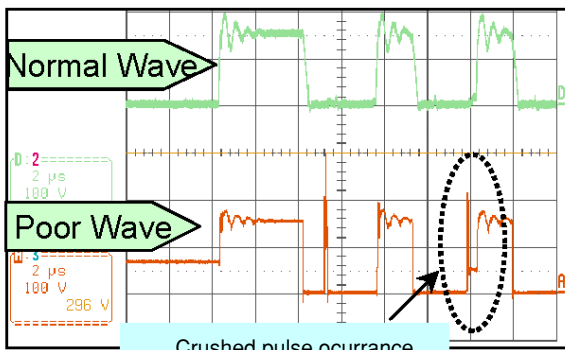
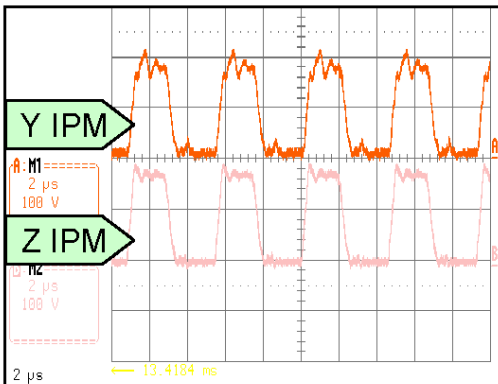


Fig. 2 When the ER\_FET is damaged



<IPM normal output wave>

- Measuring position : Sustain the enlarged picture after measuring the B50 waveform of the Y B/D and the B35 waveform of the Z B/D (Full White pattern).

### 2. FET ass'y (Y B/D : HS1) damage

- When Set\_Up FET is damaged, screen is not displayed.
  - Test point : Enlarged after measuring GND through B50 (YB/D).
  - Waveform : As shown in Fig. 3.

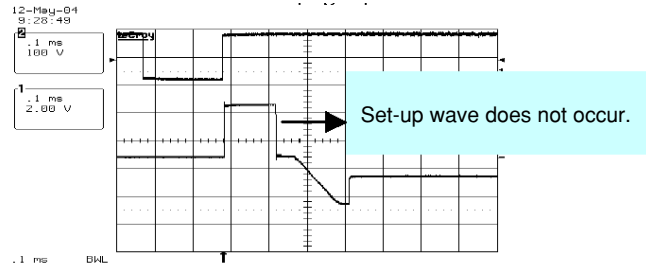


Fig. 3 When the Set\_Up FET is damaged

- When Set\_Down FET is damaged, electric discharge occurs over the entire screen.
  - Test point : Enlarged after measuring GND through B50 (YB/D).
  - Waveform : As shown in Fig. 4.

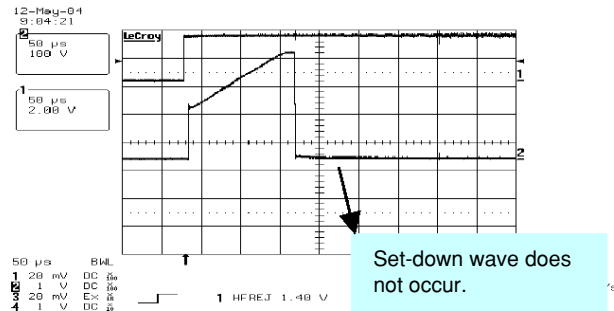
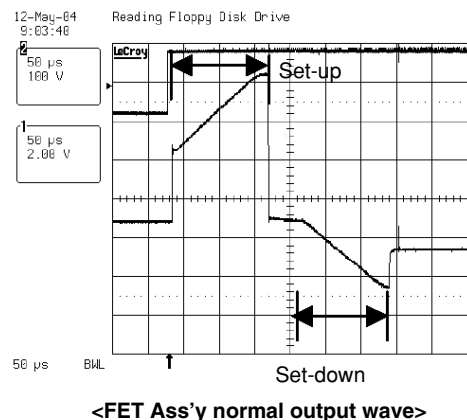


Fig. 4 When the Set\_Down FET is damaged



<FET Ass'y normal output wave>

- Measuring position : Enlarged wave of the reset section of TP B50 (Y B/D) (Full White pattern).



### 3. SCAN IC (Y drv B/D : IC1 to 12) damage

- 1) If the SCAN IC has a failure, one horizontal line may not be display on the screen.
  - Test point : ICT measurement of GND through Y drive B/D output.
  - Waveform : As shown in Fig. 5.

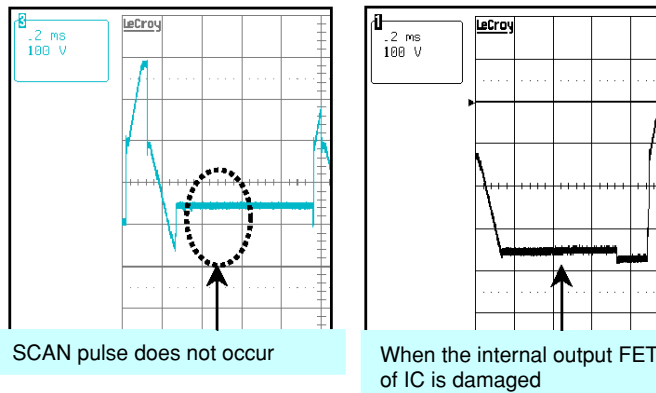


Fig. 5 When SCAN IC is poor

- 2) The screen may not be displayed when the SCAN IC failure, external electricity or spark.
  - Test point : ICT measurement of GND through Y drive B/D output.
  - Waveform : Output waveform is not output (The damage can be seen in the SCAN IC on the top or bottom of the Y drive B/D).
- 3) The screen may fluctuate horizontally when the cable on the top or bottom of the Y B/D is damaged.
  - Test point : ICT measurement of GND through Y drive B/D output.
  - Waveform : As shown in Fig. 6.

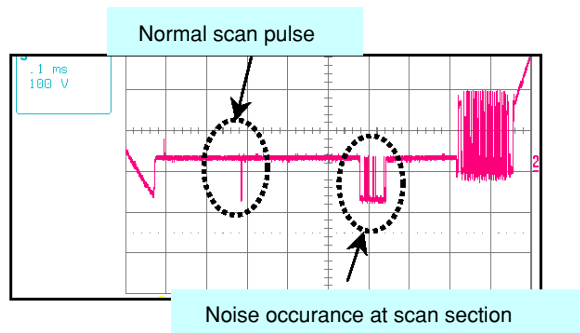


Fig. 6 When the Y drv B/D top or bottom cable is damaged

- 4) If the SCAN IC output is shorted by a dust or a foreign substance, two horizontal lines may overlap on screen.
  - Test point : ICT measurement of GND through Y drive B/D.
  - Output waveform : As shown in Fig. 7.

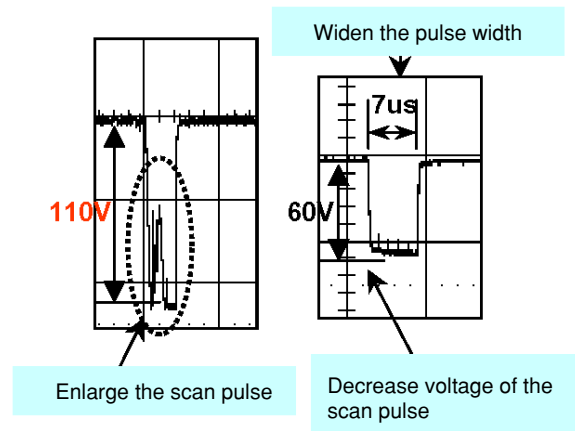
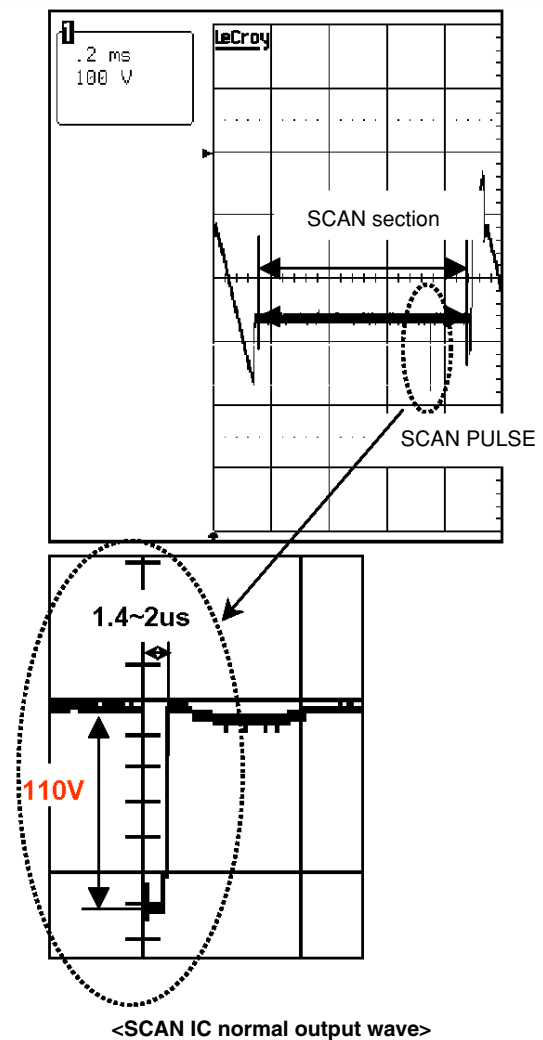


Fig. 7 When SCAN ID output is shorted



<SCAN IC normal output wave>

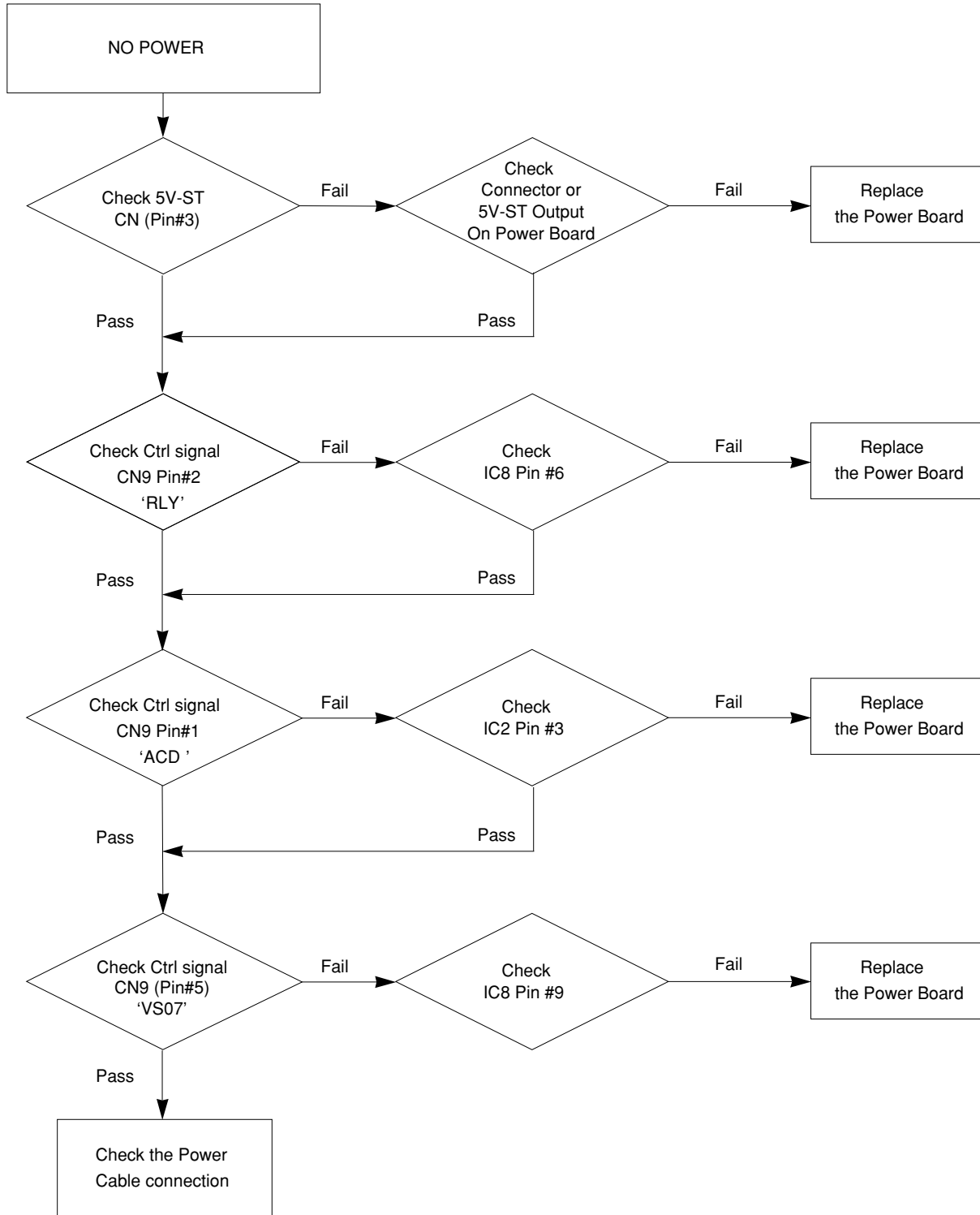
- Measuring position : The enlarged SCAN section after measuring the output ICT of the Y drive B/D. (Full White pattern).

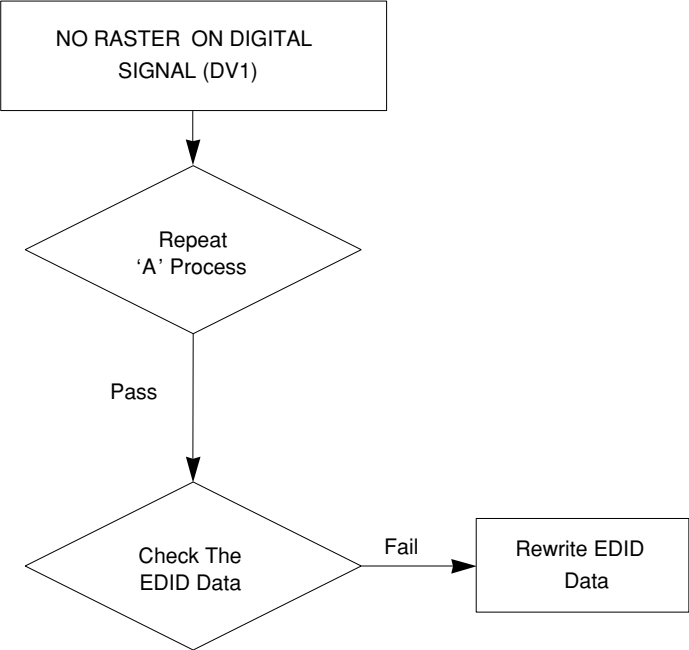


## Section 3

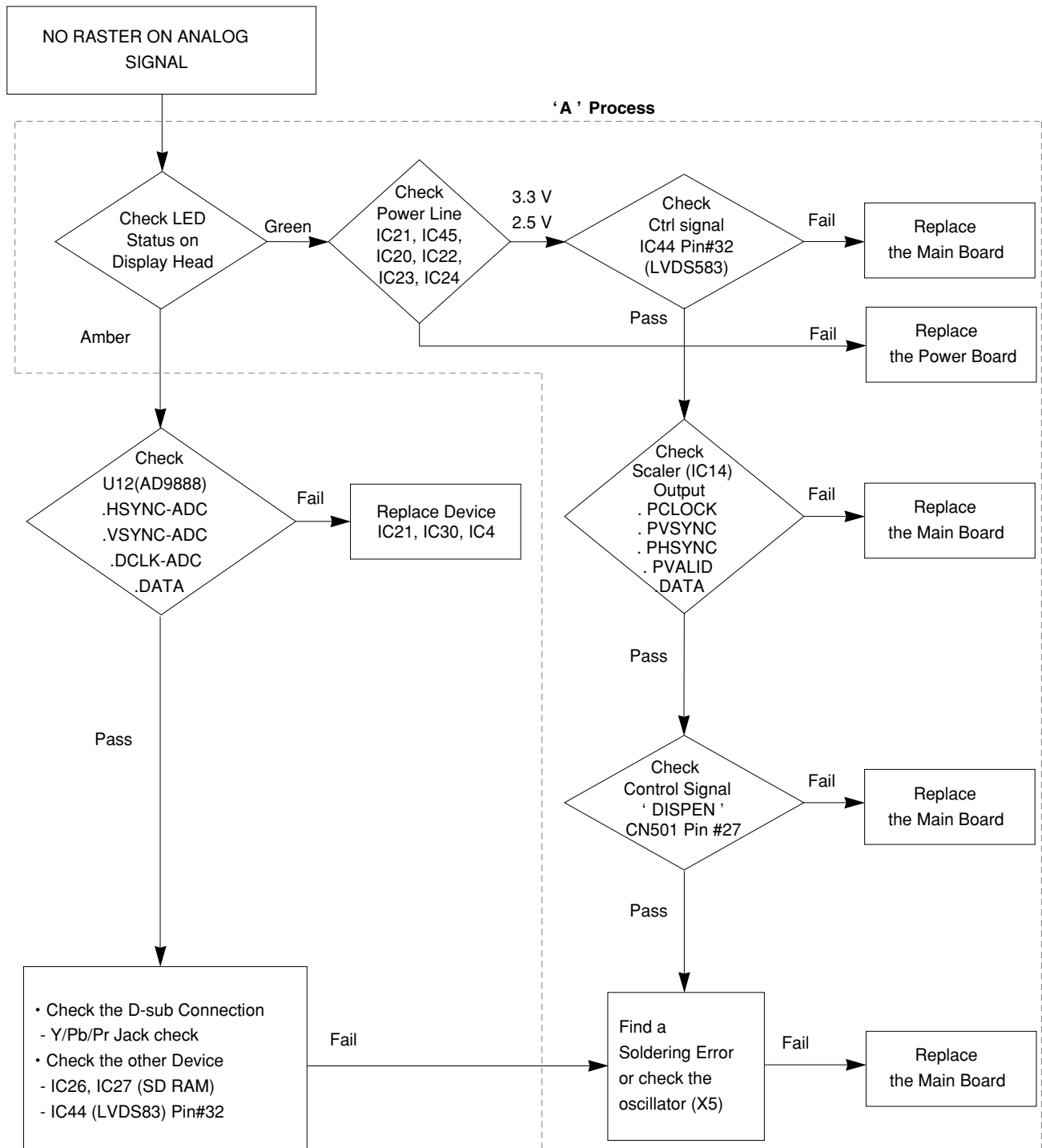
### Troubleshooting Guide

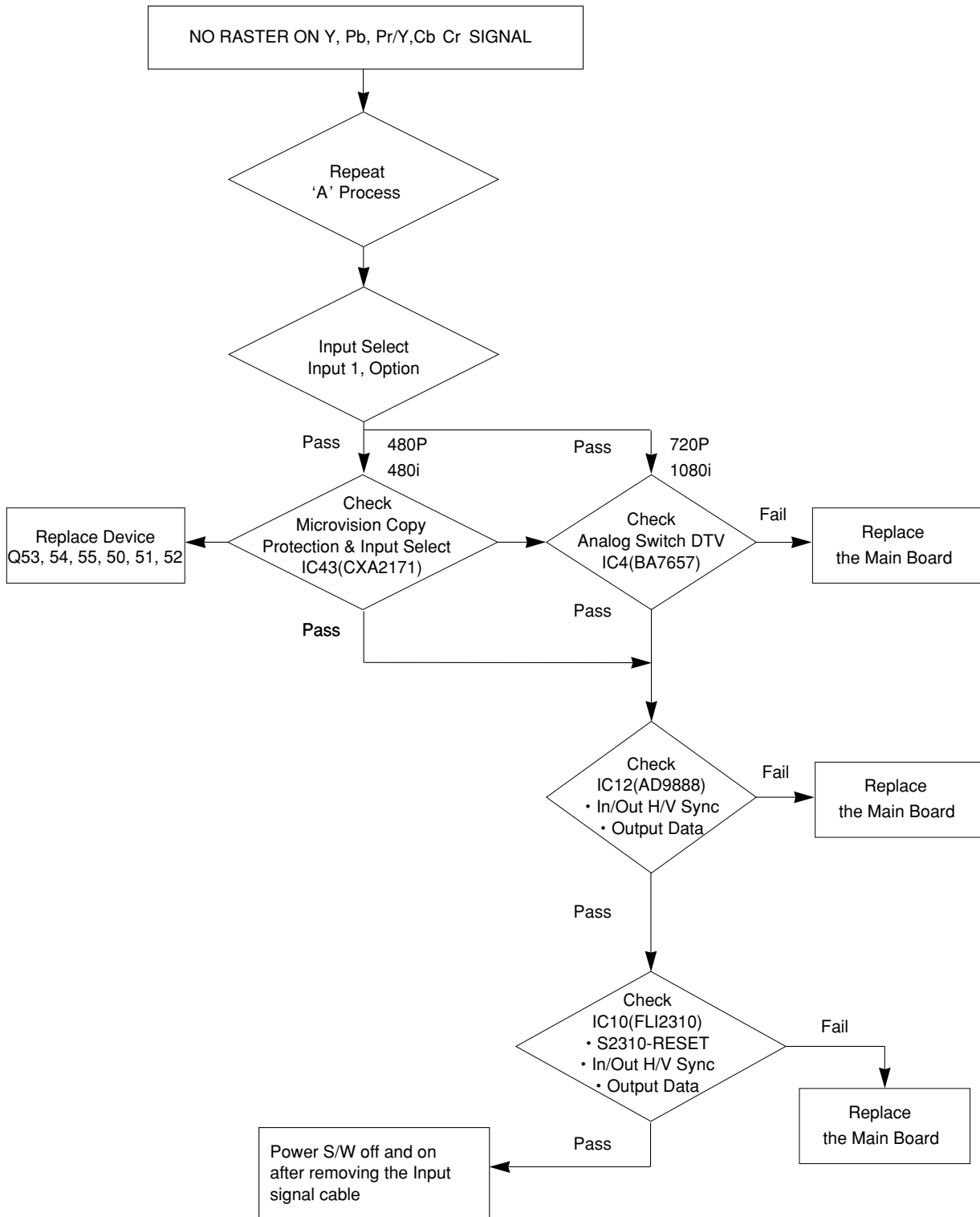
#### 3-1. Out of Order on Power

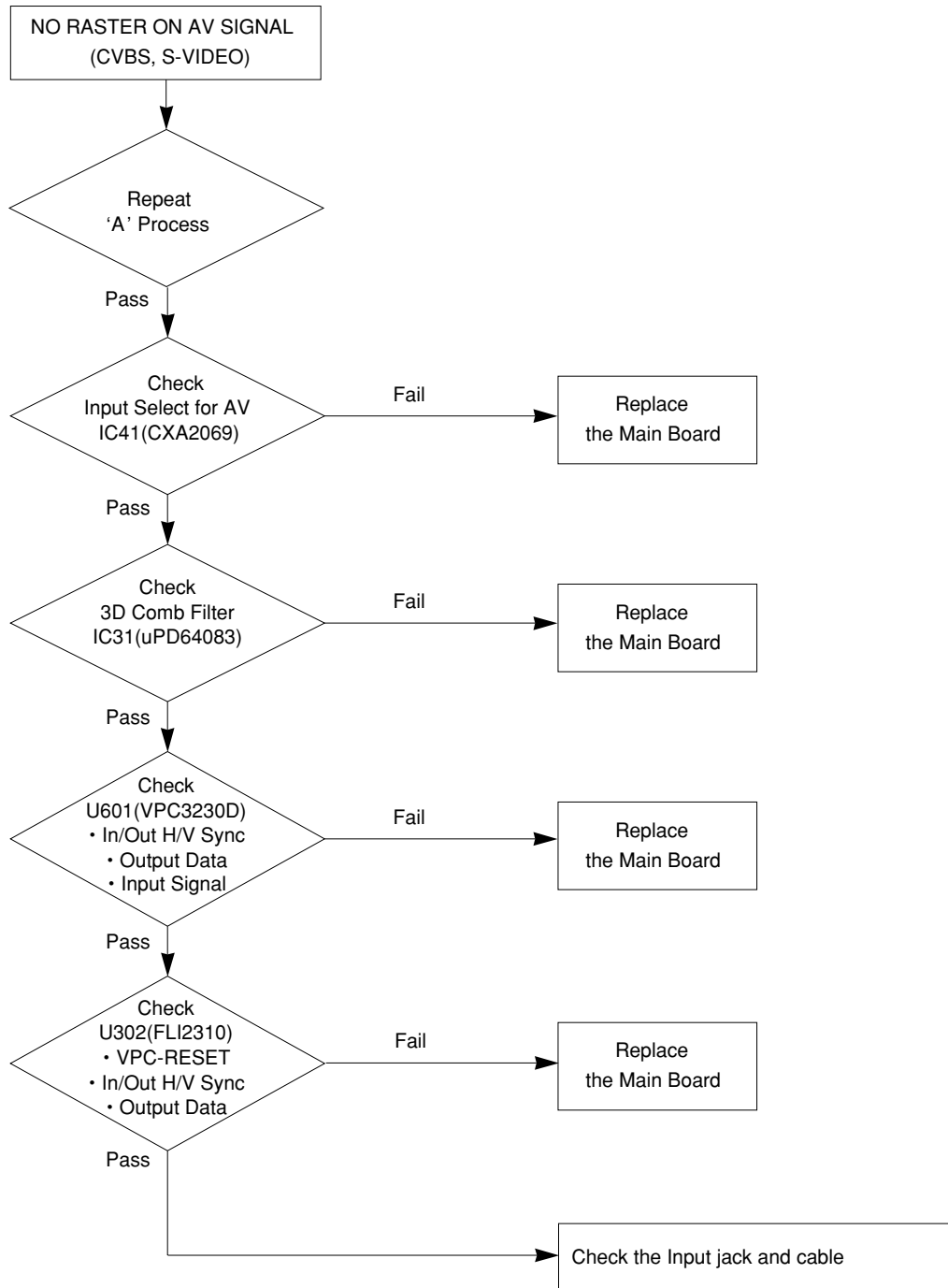


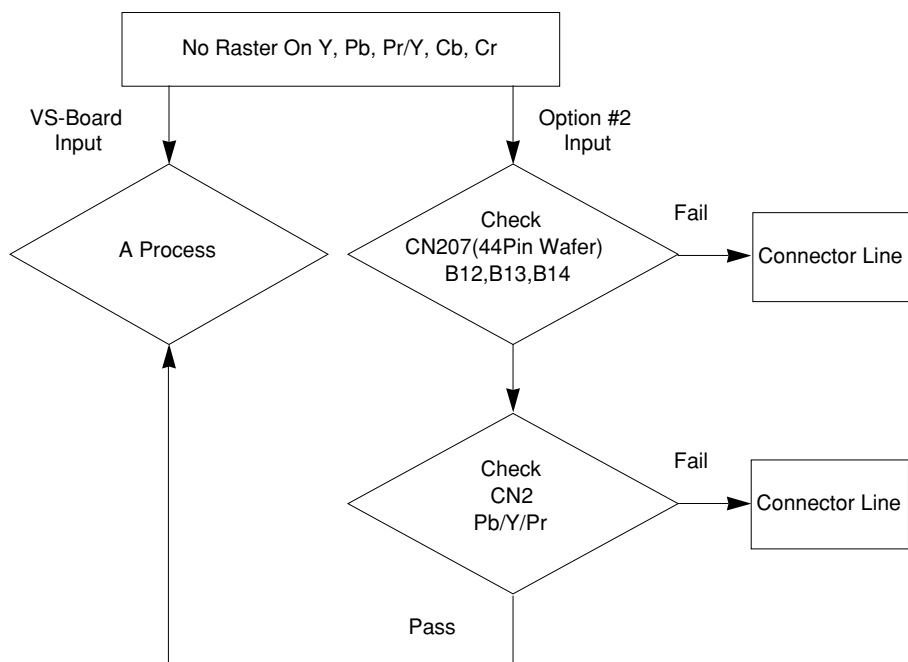
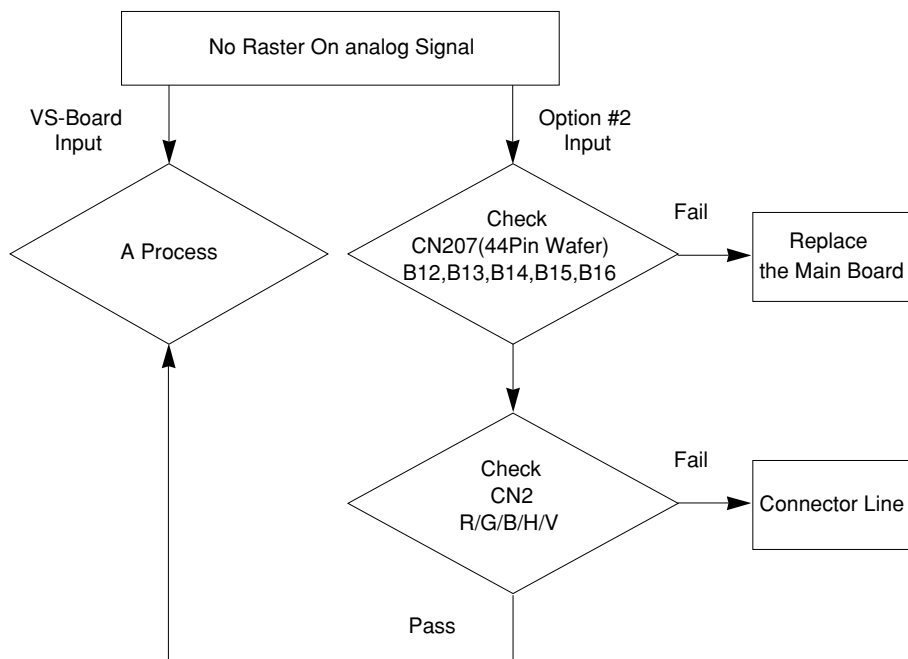


### 3-2. No Raster State



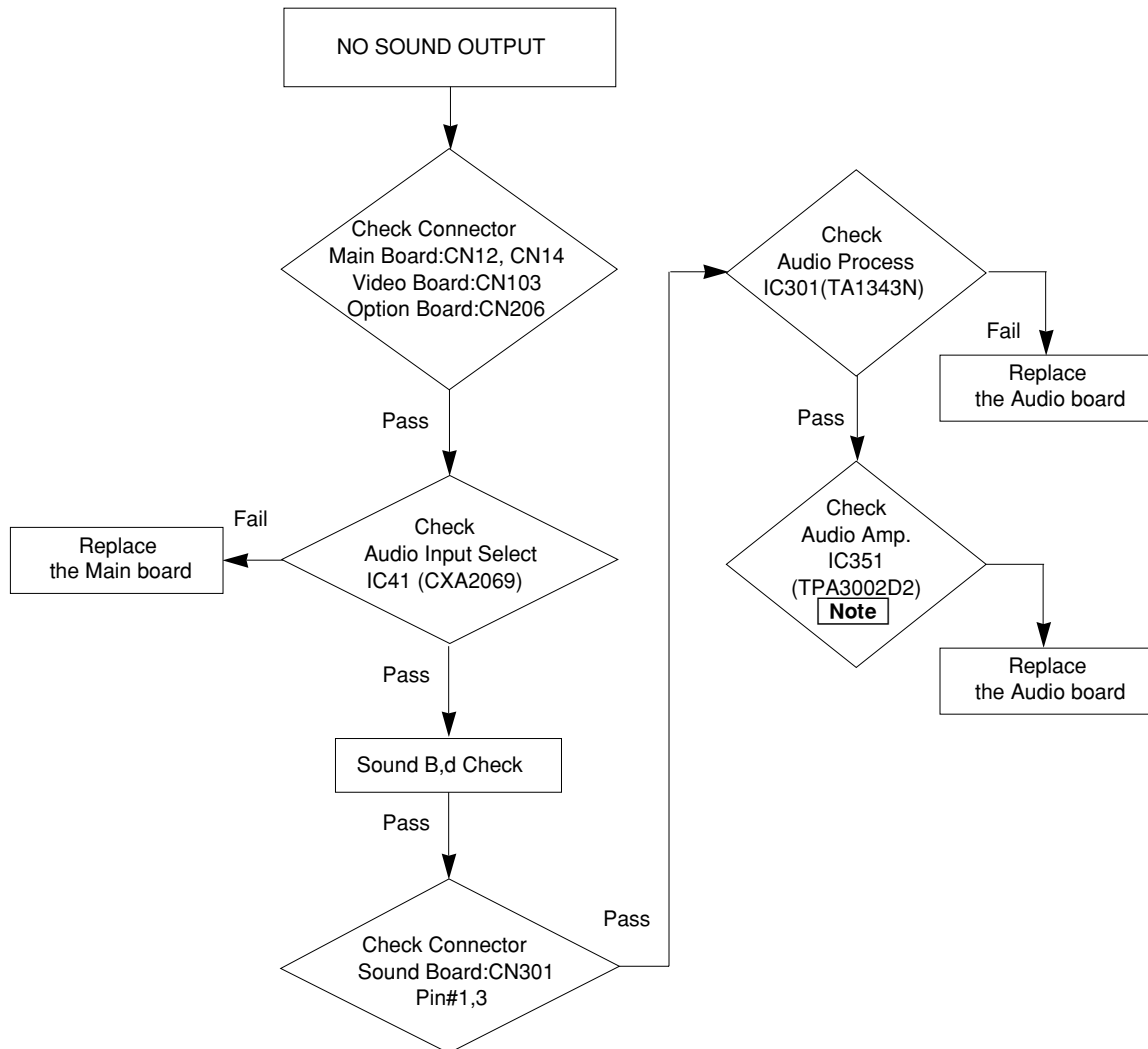








### 3-3. Sound Troubleshooting



**Note**

Sound output device (IC351) has over lod protection circuit.  
If speaker terminal is shorted in a moment.  
Sound function is stopped until the power switch off and on.



## Section 4

### Spare Parts

#### 4-1. Notes on Repair Parts

##### 1. Safety Related Components Warning

###### **WARNING**

Components marked  $\triangle$  are critical to safe operation.  
Therefore, specified parts should be used in the case of replacement.

###### **WARNHINWEIS**

Les composants identifiés par la marque  $\triangle$  sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifié.

##### 2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.  
Parts List has the present standardized repair parts.

##### 3. Stock of Parts

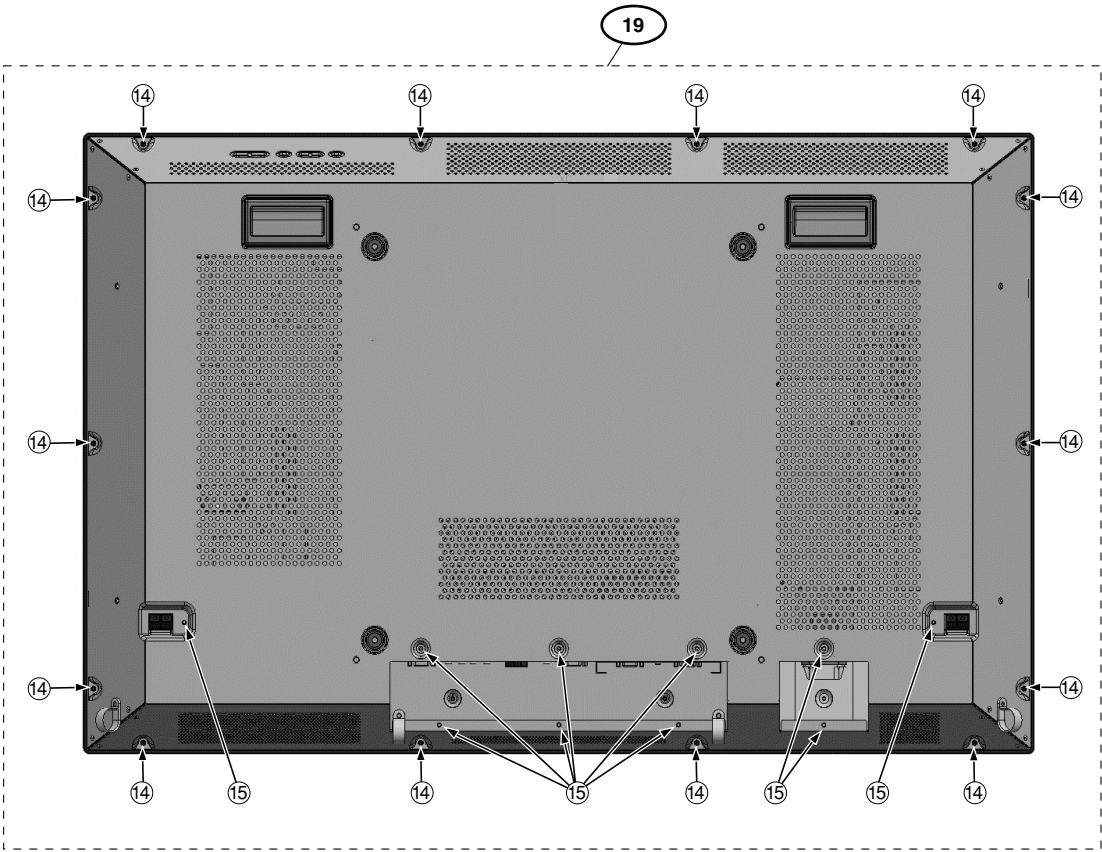
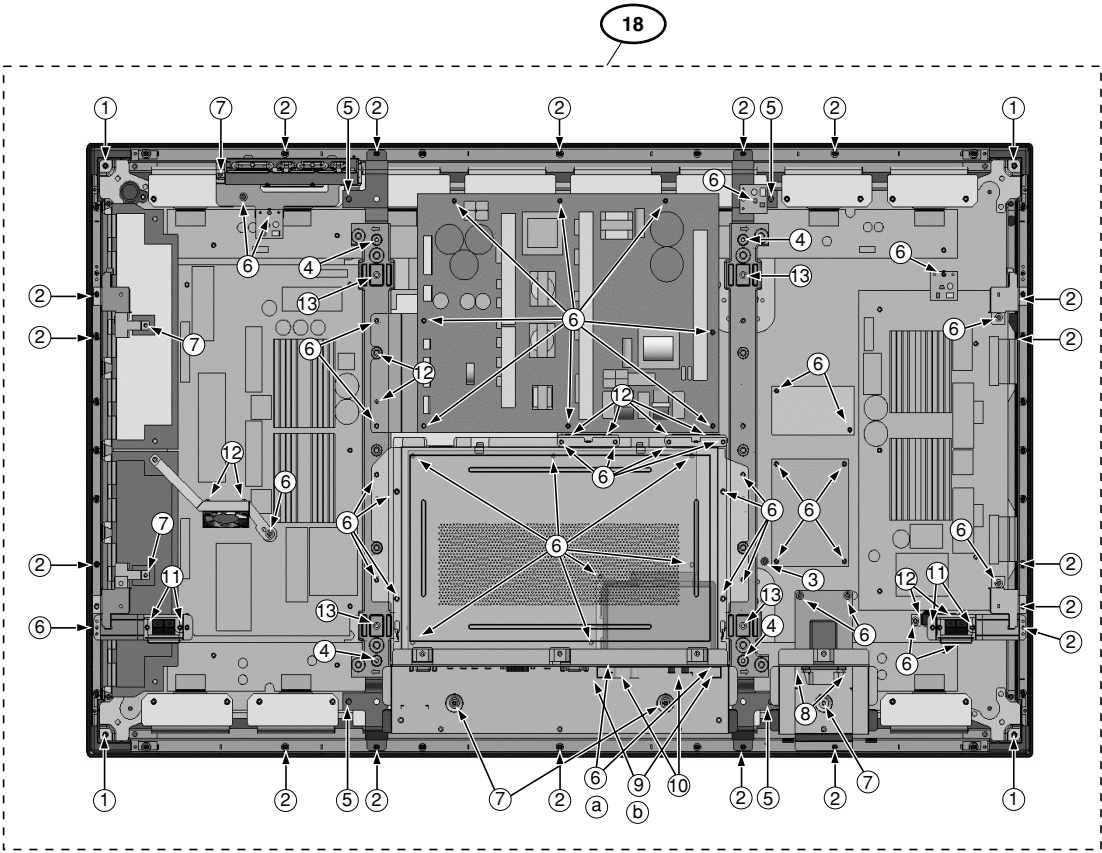
Parts marked with “o” at SP (Supply Code) column of the Spare Parts list may not be stocked. Therefore, the delivery date will be delayed.  
Items with no part number and no description are not stocked because they are seldom required for routine service.

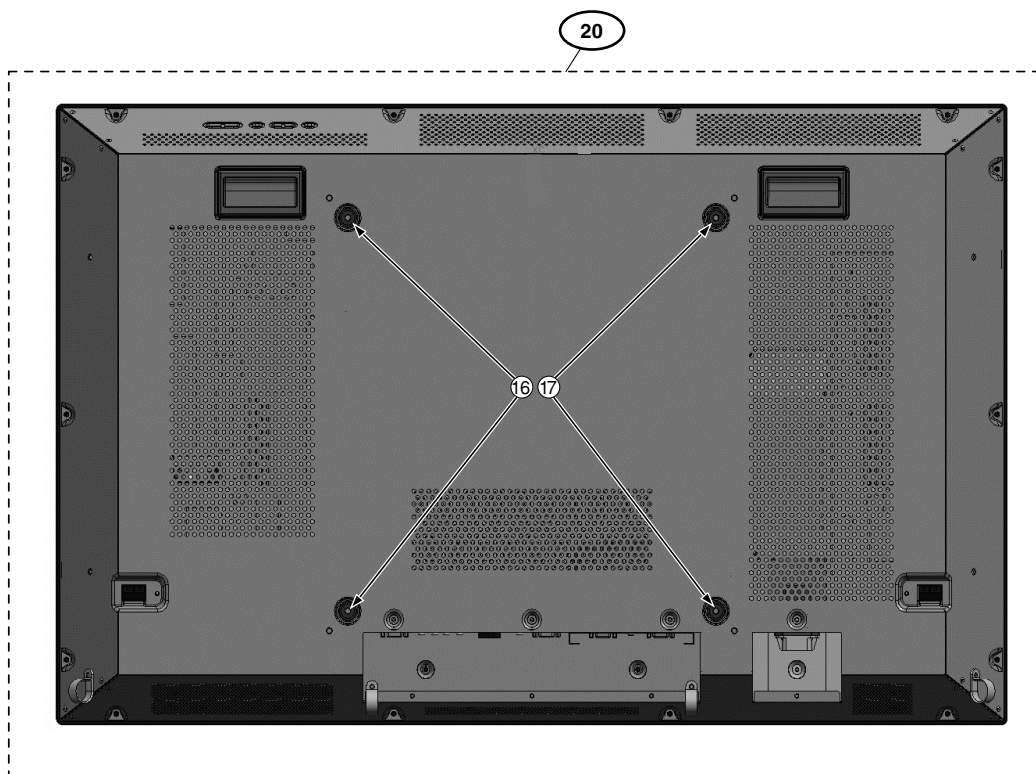
##### 4. Units for Capacitors, Inductors and Resistors

The following units are assumed in Schematic Diagrams, Electrical Parts List and Exploded Views unless otherwise specified.

Capacitors	: $\mu\text{F}$
Inductors	: $\mu\text{H}$
Resistors	: $\Omega$

4-2. Exploded Views





Note : The screws can be ordered in units of screw kit. (Sony part No. 20 to 22)

No.	Part No.	SP Description	No.	Part No.	SP Description	No.	Part No.	SP Description
18	X-2022-846-1 s	SCREW KIT, INSIDE	19	X-2022-848-1 s	SCREW KIT, OUTSIDE	20	X-2022-847-1 s	SCREW KIT, WALL MOUNT

INSIDE SCREW KIT

- |   |             |
|---|-------------|
| ① | 1SZZTMP007C |
| ② | 332-102C    |
| ③ | 339-006B    |
| ④ | 339-009C    |
| ⑤ | 1SZZTMP007A |
| ⑥ | 339-008H    |
| ⑦ | 339-008K    |
| ⑧ | 339-008L    |
| ⑨ | 1SZZTMF012A |
| ⑩ | 332-113E    |
| ⑪ | 332-113D    |
| ⑫ | 339-008F    |
| ⑬ | 1SZZTMB005B |
| a | 1NHB0302118 |
| b | 1WZZTKK005A |

OUTSIDE SCREW KIT

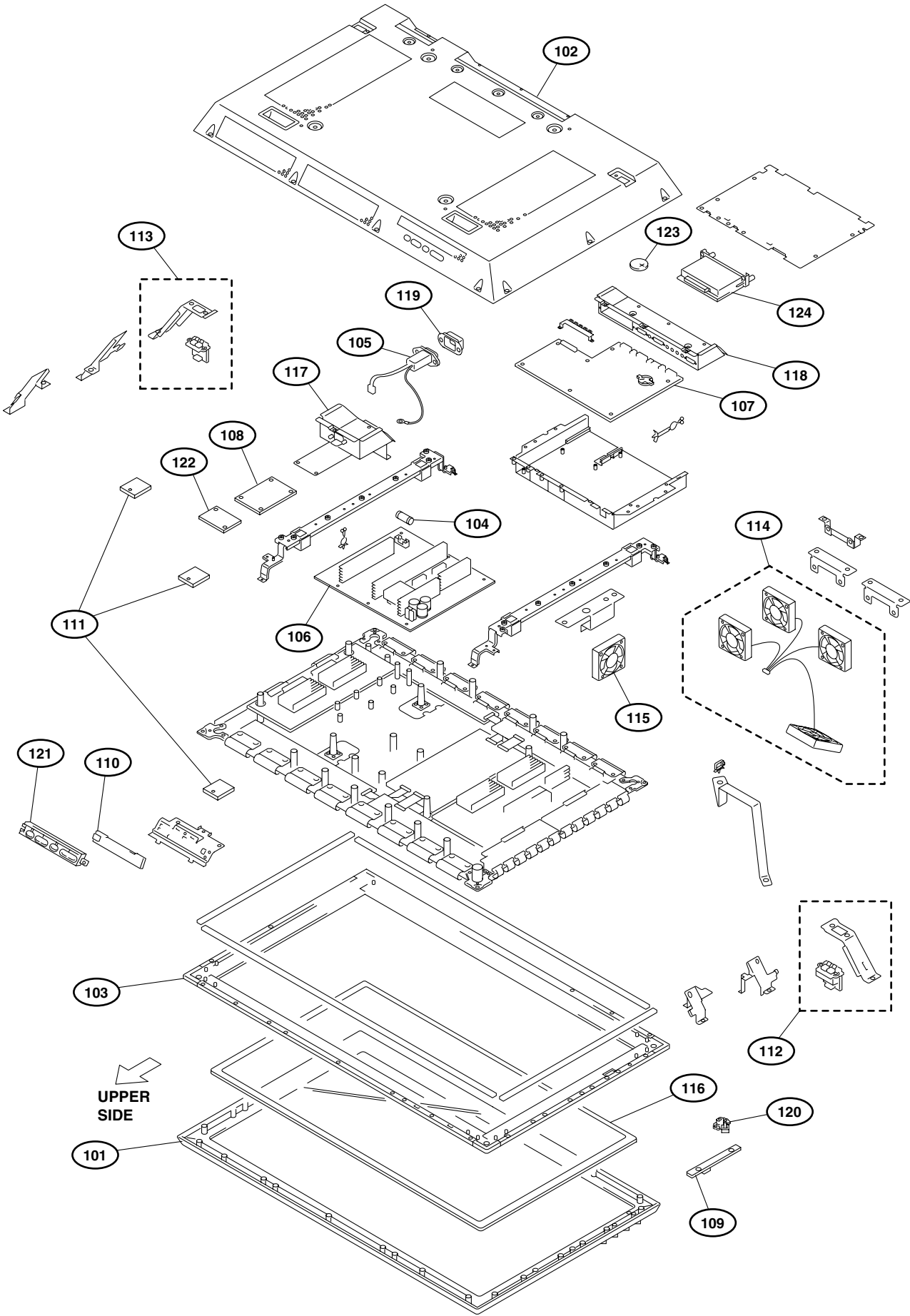
- |   |          |
|---|----------|
| ⑭ | 332-102R |
| ⑮ | 339-008K |

WALL MOUNT SCREW KIT

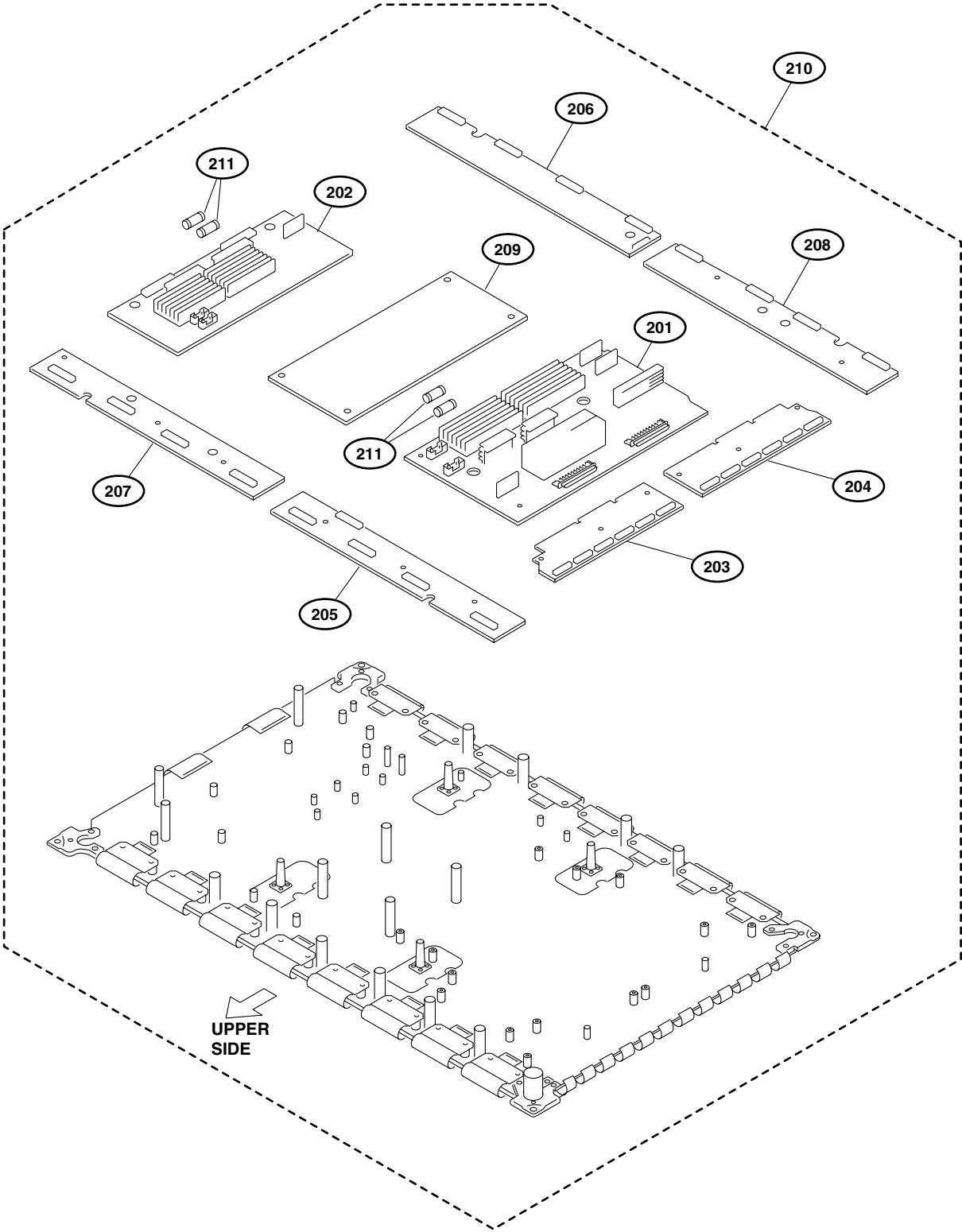
- |   |             |
|---|-------------|
| ⑯ | 1WZZTKK004B |
| ⑰ | 1SZZTMH003B |

• The numbers encircled by round corresponds to numbers in illustrations.

Cover



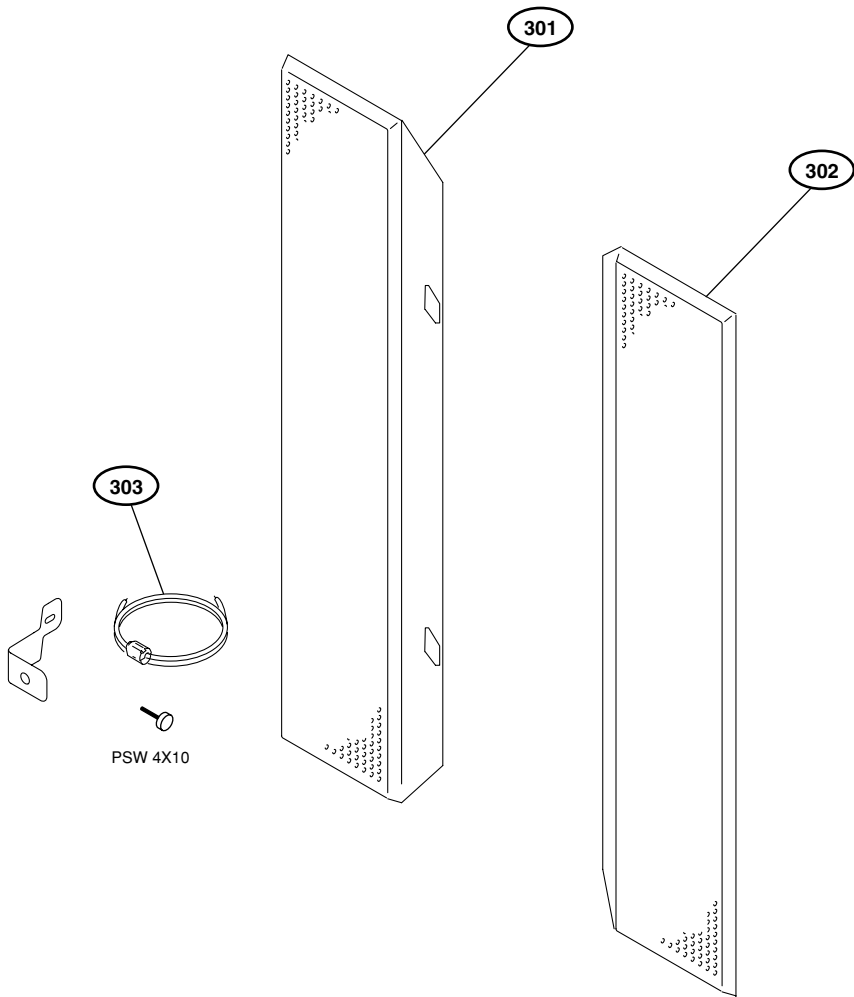
No.	Part No.	SP Description
101	△ X-2022-844-1	s ASSY, BEZEL (BLACK)
	△ X-2022-849-1	s ASSY, BEZEL (SILVER)
102	△ X-2022-845-1	s ASSY, REAR COVER (BLACK)
	△ X-2022-852-1	s ASSY, REAR COVER (SILVER)
103	X-2024-229-1	s ASSY, FRONT FRAME
104	△ 1-576-300-12	s FUSE H.B.C. (8A/250V)
105	△ 1-417-398-11	s AC INLET
106	△ 1-761-969-11	s MOUNTED CIRCUIT BOARD, G
107	1-761-970-11	s MOUNTED CIRCUIT BOARD, A
	1-761-982-11	s MOUNTED CIRCUIT BOARD, A (PFM-42X1N)
108	1-761-971-11	s MOUNTED CIRCUIT BOARD, L
109	1-761-972-11	s MOUNTED CIRCUIT BOARD, H1
110	1-761-973-11	s MOUNTED CIRCUIT BOARD, H2
111	1-761-974-11	s MOUNTED CIRCUIT BOARD, TEMP
112	1-761-975-11	s MOUNTED CIRCUIT BOARD, T (L)
113	1-761-976-11	s MOUNTED CIRCUIT BOARD, T (R)
114	△ 1-787-207-11	s FAN, DC
115	△ 1-787-254-11	s DC FAN
116	2-159-847-01	s GLASS, FILTER
117	2-318-610-01	s AC SOCKET COVER (BLACK)
	2-318-610-11	s AC SOCKET COVER (SILVER)
118	2-318-611-01	s MAIN FLAME COVER (BLACK)
	2-318-611-11	s MAIN FLAME COVER (SILVER)
	2-318-611-21	s MAIN FLAME COVER (PFM-42X1N)
119	2-990-241-01	s HOLDER (A), PLUG
120	4-101-215-01	s BUTTON, POWER
121	4-101-217-01	s MULTI BUTTON (GRAY)
	4-101-217-11	s MULTI BUTTON (BLACK)
122	1-789-070-11	s MOUNTED CIRCUIT BOARD DDC CI
123	△ 1-528-174-11	s BATTERY, LITHIUM (CR2032 TYPE)
124	1-761-816-11	s MOUNTED CIRCUIT BOARD, OP-1





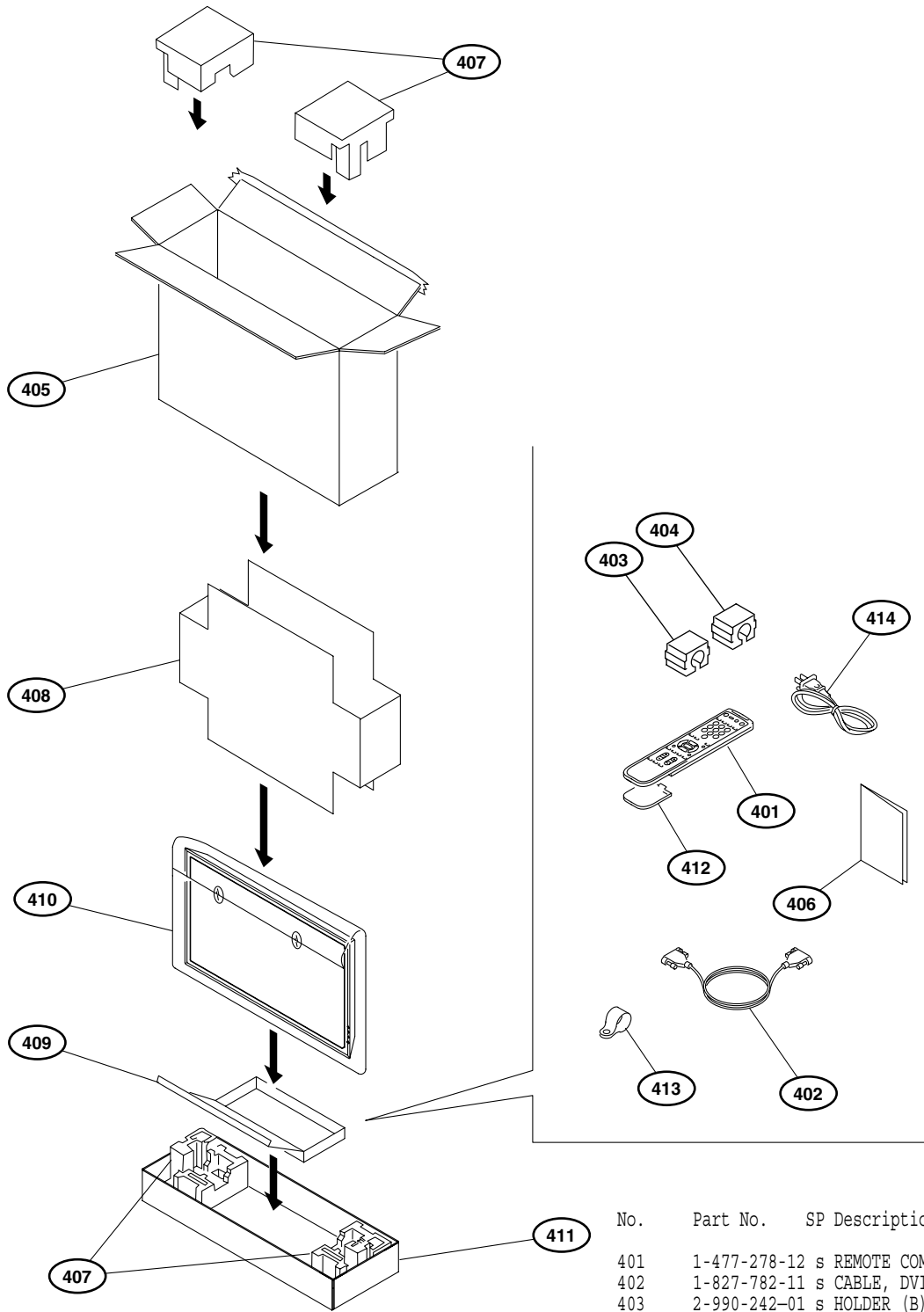
No.	Part No.	SP Description
201	1-761-977-11	s MOUNTED CIRCUIT BOARD, Y-SUS
202	1-761-978-11	s MOUNTED CIRCUIT BOARD, Z-SUS
203	1-761-979-11	s MOUNTED CIRCUIT BOARD, YDT
204	1-761-980-11	s MOUNTED CIRCUIT BOARD, YDB
205	1-761-988-11	s MOUNTED CIRCUIT BOARD, XLT
206	1-761-989-11	s MOUNTED CIRCUIT BOARD, XRB
207	1-761-990-11	s MOUNTED CIRCUIT BOARD, XRT
208	1-761-991-11	s MOUNTED CIRCUIT BOARD, XLB
209	1-761-992-11	s MOUNTED CIRCUIT BOARD, CTRL
210	△ 1-805-659-11	s DISPLAY PANEL, PLASMA
211	△ 1-576-233-12	s FUSE (H.B.C.) 6.3A/250V

SS-SP20B/SP20S (Speaker)



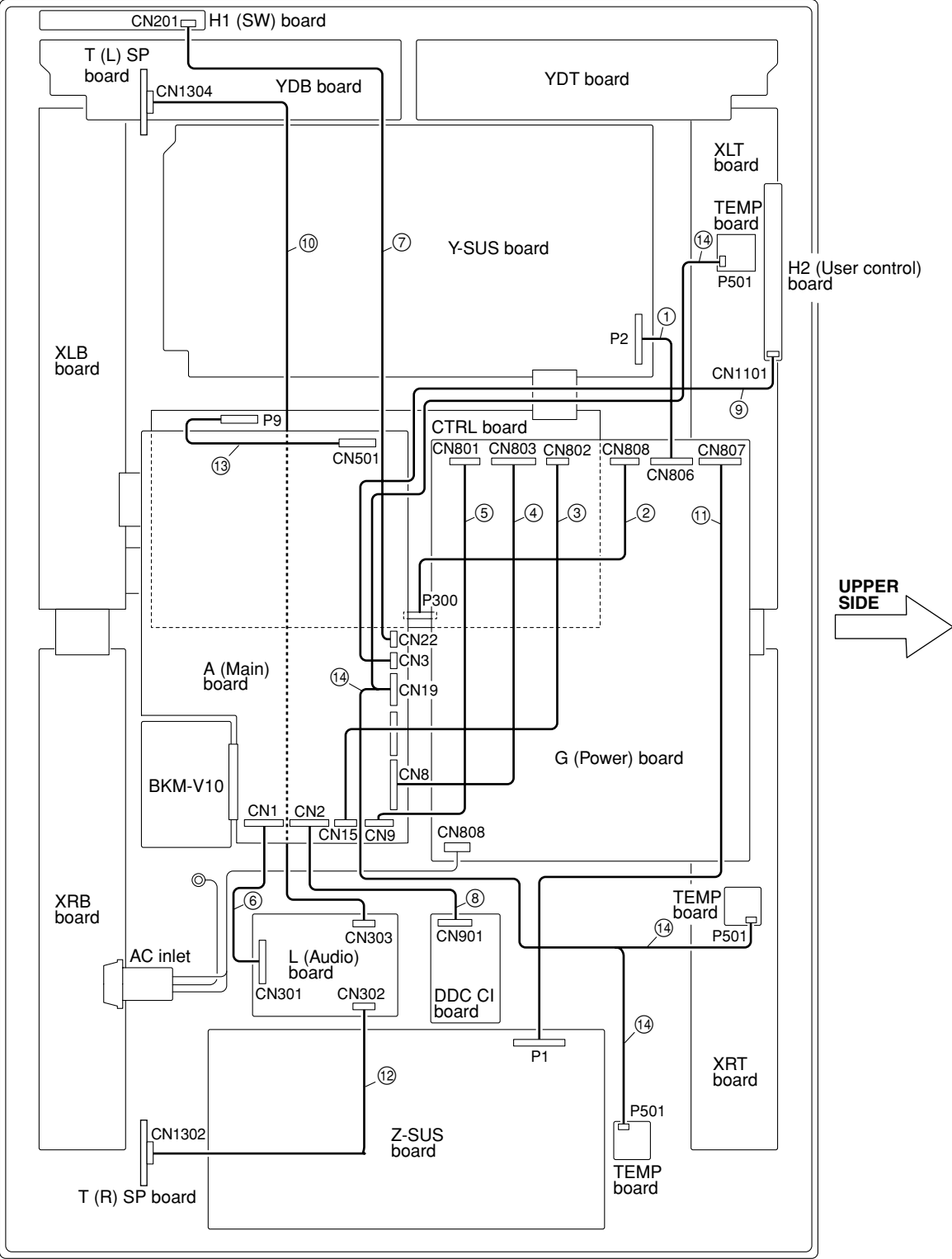
No.	Part No.	SP Description
301	1-825-627-11 s	LOUDSPEAKER L (BLACK)
	1-825-628-11 s	LOUDSPEAKER L (SILVER)
302	1-825-627-21 s	LOUDSPEAKER R (BLACK)
	1-825-628-21 s	LOUDSPEAKER R (SILVER)
303	1-900-276-27 s	CONNECTOR ASSY (SP)

Screws/Washers  
7-682-962-09 s SCREW PSW 4X10



No.	Part No.	SP Description
401	1-477-278-12	s REMOTE COMMANDER (RM-971)
402	1-827-782-11	s CABLE, DVI
403	2-990-242-01	s HOLDER (B), PLUG
404	3-613-640-01	o HOLDER (C), PLUG
405	2-176-251-01	o INDIVIDUAL CARTON
406	2-149-020-01	s MANUAL, INSTRUCTION (JAPANESE, ENGLISH, FRENCH, GERMAN, SPANISH, ITALIAN, SIMPLIFIED CHINESE)
407	4-101-220-01	o CUSHION, TOP& BOTTOM
408	4-101-222-01	o CARTON, INSIDE
409	4-101-224-01	o ACCESSORY BOX
410	4-101-223-01	o BAG, PROTECTION
411	4-101-219-01	o TRAY, BOTTOM
412	4-978-977-01	s LID, BATTERY (BLACK)
413	4-101-214-01	s HOLDER, CABLE
414	Δ -----	s CORD, SET POWER (See 1-4. Warning on Power Connection.)

Board Connections



No.	Part No.	SP Description
①	1-910-002-73	o CONNECTOR ASSY, Y SUS 9P
②	1-910-002-74	o CONNECTOR ASSY, X SUS 8P
③	1-910-002-75	o CONNECTOR ASSY, MAIN 4P
④	1-910-002-76	o CONNECTOR ASSY, MAIN 12P
⑤	1-910-002-77	o CONNECTOR ASSY, MAIN 7P
⑥	1-910-002-78	o CONNECTOR ASSY, AU 12P
⑦	1-910-002-79	o CONNECTOR ASSY, RMT 8P
⑧	1-910-002-80	o CONNECTOR ASSY, DDC CI 11P
⑨	1-910-002-81	o CONNECTOR ASSY, KEY 4P
⑩	1-910-002-82	o CONNECTOR ASSY, SPKL 4P
⑪	1-910-002-83	o CONNECTOR ASSY, Z-SUS 8P
⑫	1-910-002-84	o CONNECTOR ASSY, SPK R 4P
⑬	1-910-002-85	o CONNECTOR ASSY, LVDS
⑭	1-910-002-86	o CONNECTOR ASSY, SENS 9P

• The numbers encircled by round corresponds to those of the left illustration.



## SAFETY CHECK-OUT

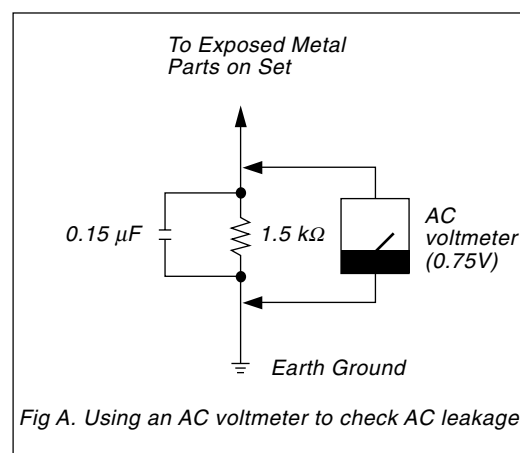
After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)



PFM-42X1 (SY)  
PFM-42X1N (SY) E  
9-968-071-01

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B&P Company

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